The Journal of Laryngology and Otology

(*Founded in* 1887 *by* MORRELL MACKENZIE *and* NORRIS WOLFENDEN)

October 1961

EDITORIAL NOTE

IT WAS with great regret that the Directors of the *Journal of Laryngology and Otology* accepted the resignation of the Editor, Mr. W. G. Howarth, at their meeting on September 6th, 1961.

A change of editor is not a common occurrence with this Journal. The last change was in 1929. Mr. Howarth has occupied this post for thirty-two years. During this time the Journal has survived a great war and today has a bigger circulation than ever in its history. It is hard to assess his contribution to the survival and growth of the Journal. He inherited it from his famous Edinburgh predecessors, Drs. Logan Turner and J. S. Fraser, in a healthy state. He transplanted it from Edinburgh to London, and has kept it in a vigorous and flourishing condition ever since. He has looked after it for so long that very few of his present colleagues can remember the Journal before Walter Howarth was the Editor. The sense of loss felt by his co-Directors at his resignation can therefore be imagined, and the reluctance with which they accepted it will be shared by all contributors.

During the last few years Walter Howarth has had several periods of ill health, but he has always managed to retain effective control of the Journal, and his has been the hand which has maintained the standard of the Journal through all the difficulties of war, austerity, paper control and printers' strike. He has increased the circulation in all parts of the world, and of a monthly issue of over 1,500 copies, more than 1,000 are posted overseas. The Journal has always tried to maintain a high standard of paper, printing and illustration, and we think that under Mr. Howarth's leadership this objective has been achieved. There can be few monthly journals, without a paid editorial staff, in which the standard has been so well maintained.

In May this year Walter Howarth was taken ill, and he has not yet recovered sufficiently to resume control of the Journal. He was unwilling to remain in nominal charge without being able to exercise real control, and he therefore resigned his post rather than create difficulties for the deputies who were continuing the publication of the Journal. All of us associated with the Journal were reluctant to accept his resignation, but acceded because we felt that an institution

which had been growing since 1887 was more important than an individual, even though that individual had been the most important influence in its present existence, apart from the original founders, Morell Mackenzie and Norris Wolfenden.

The Journal has existed for seventy-four years, and during the last thirty-two years Walter Howarth has directed its fortunes with conspicuous success. If he had done nothing else, Otolaryngology in Great Britain would owe him a great debt. This is not the case. He had established himself in Otolaryngology in this country before he accepted the responsibility for the Journal. He was a pioneer in this country for peroral endoscopy. He was the first throat surgeon at St. Thomas' Hospital, being appointed in 1911. When the Ear and Throat Departments were combined at St. Thomas' in 1932 he was the first Surgeon-in-Charge of the combined department. One of the standard external operations for frontal sinusitis is known in this country by his name, and as long as external frontal sinus operations are performed examinees will have to know his name. He was one of the earliest otolaryngological surgeons in this country, and did much to raise the status of the speciality to respectability in the eyes of the surgical world. We owe him a great debt for this alone.

It is not our function to enumerate all the contributions made by Walter Howarth to Otolaryngology, nor to list the important positions in the speciality held by him during a remarkably long and fruitful working life. We can only express our sincere regret that he will no longer direct the fortunes of the Journal.

We, his successors, hope that we can maintain the high standards, professional and ethical, set by him, and if we can achieve this hope the immediate future of the Journal is secure.

The continued success of the Journal is of great importance to British Otolaryngology. It is owned by otolaryngologists; it does not pay dividends; it is independent of any professional organization; and it tries to serve the speciality. Walter Howarth guarded its independence with great integrity. His successors will try to maintain its position.

For most subscribers this issue will be the first to be delivered to them without Walter Howarths' name on the title page. There are relatively few present subscribers who subscribed while Logan Turner was editor. It is indeed a change in the established order. During this time, there have been many changes in the title page and the one constant feature has been "Edited by Walter Howarth". Now this has changed. His successor was trained at King's College Hospital, and then transferred to St. Thomas', where he came under the influence of Walter Howarth. He then succeeded him on the staff of St. Thomas'. Many years, and a war, later he became Assistant Editor of the Journal, when he was again educated by Walter Howarth.

The new Assistant Editor was trained at St. Thomas', as was the editor of *The Laryngoscope*, and then was appointed to the staff of the Charing Cross Hospital. He was thus only indirectly exposed to the influence of Walter Howarth. Howarth's influence at St. Thomas' was so strong, however, that the new Assistant Editor must have been affected by it.

The new editorial staff hope that they will be able to serve the subscribers as well and as conscientiously as Walter Howarth has served the Journal for thirty-two years.

PROBLEMS OF TYMPANOPLASTY*

By DIETRICH PLESTER, M.D.

I SHALL confine my remarks to certain problems of tympanoplasty showing some of the ways in which we have attempted to solve these.

The points chosen for discussion are:

1. Choice and preparation of the graft material.
2. Preservation or removal of the cholesteatoma matrix.
3. Tympanoplasty in a discharging ear.
4. Remarks concerning the type IV tympanoplasty.
5. Tympanoplasty in a radical cavity.
6. Treatment of the Eustachian tube; tympanoplasty with a closed Eustachian tube.

Choice and preparation of graft material

After exposure of the middle ear by the endaural or post-auricular route the size of the flap required for closure of the tympanum is estimated. Free grafts taken from the external auditory meatus are used exclusively. In practically all cases a flap of adequate magnitude can be obtained. Free grafts from the post-auricular fold as described by Wullstein yield much more material, not only for closure of the middle ear but also for lining the mastoid cavity. However, the use of such grafts as well as those taken from other sites like the arm, the leg, or the abdomen, is not without drawbacks. Post-auricular grafts appear to be especially suitable because they contain only few elastic fibres and hairs. Closure of tympanic defects and improvement in hearing may well be achieved by employing post-auricular skin; however, the formation of graft cholesteatomas has been observed by us and other authors in numerous cases. These graft cholesteatomas originate from the hair follicles and may be found years after the transplantation was performed. The presence of sweat and sebaceous glands in tissue intended to replace a part or the whole of the eardrum cannot be immaterial for the functional result. Therefore, in the past three years we have been using skin from the external meatus in over 700 cases. This skin is free of elastic fibres and does not contain hairs or glandular elements. Formerly we covered the middle ear with a meatal graft and used skin from behind the ear for lining the rest of the cavity.

* Paper presented to the Section of Otology, Royal Society of Medicine, on February 3rd, 1961.

Desquamation from such transplants into the cavity is often excessive, necessitating frequent ear toilet.

Moreover, after primary healing, sometimes after months, or even years, during the course of a cold the operated ear suddenly may start discharging again. On inspection of the cavity a thickened skin with eczematous changes is found. Often a permanent drainage from the ear persists. Therefore, any lining of the mastoid cavity has been abandoned in order to facilitate natural and resistant epithelialization. The absence of elastic fibres in the meatal skin allows cutting a graft of suitable size which will neither shrink nor curl up at the edges, as grafts from arm or leg will do, and thus it is easy to place into position.

This graft requires no preparation except trimming of edges as the under-surface consists only of a thin and smooth periosteal layer. A further advantage is that the epithelial layer of the eardrum can be removed right up to the margin of the perforation along with the meatal skin in one continuous piece. This both increases the size of the graft and ensures that the bed to be covered is entirely free of epidermal remnants which might lead to cholesteatoma formation. We have the impression that there is less tendency to form adhesions in the middle ear than with other grafting material due to the presence of periosteum.

We confine ourselves to closing off the tympanum, leaving the remaining cavity bare. The time it takes for the cavity to become fully epithelialized is only slightly longer and so far few cavities have become reinfected—certainly less than 10 per cent.

The more experience we obtained in dissecting and handling of the meatal flap the more recurrent perforations have been observed. The reason was, that with growing skill only the thinner parts of the meatal skin especially from the inner anterior and inferior portion of the canal were used. Therefore, today the meatal skin up to the hairline is taken advantage of, the thickest portion of the flap being used for the closure of large perforations. Small ones will heal with any portion of meatal skin.

In very large perforations the middle ear is first closed with a fascial transplant from the temporal muscle. It receives an additional nutritional basis on the promontory. This fascia then is covered with meatal skin.

After closing the middle ear with our graft the entire cavity is filled with gelatine sponge soaked in an antibiotic solution. This keeps the graft in position and is a protection against infection from outside. The packing is removed by suction 15 to 20 days after the operation. By then a small cavity may be found already fully epithelialized, but larger ones require sterile post-operative care to avoid formation of granulations which may cause considerable delay in healing.

Following general surgical principles skin from as near to the tympanum as possible is utilized for grafting. By the same reasoning we prefer middle-ear mucosa to any other mucous membrane in those exceptional

cases where mucosal transplants are required. In cases with marked adhesions, tympanosclerosis, or after extensive evacuation of hypotympanic cells usually a sufficient amount of mucous membrane from around the tympanic orifice of the Eustachian tube can be obtained. Other suitable donor sites are the epitympanic space or the region of the oval window (in tympanoplasties type IV).

Preservation or Removal of the Cholesteatoma Matrix

This has always been a debatable subject. Baron, in 1949, among others, stated that he preserves the matrix of a cholesteatoma. Later, in 1953, he emphasized his opinion which was supported by a series of macroscopic and microscopic studies. Zöllner expressed similar views in 1957. We also have had some good results from the use and preservation of cholesteatoma matrix. There are two different clinical manifestations of cholesteatoma which require different treatment. In one type the cholesteatoma has the appearance of a pea or a bean. After removal of the cholesteatomatous material the surface is smooth without any indentations. After lifting the matrix its undersurface is smooth also. In this type of cholesteatoma the matrix may be left in the attic, the aditus of the mastoid antrum, or in the antrum itself. Epithelialization of the cavity will thus be hastened. The retrotympanic spaces are always opened from the defect of the eardrum or the bony meatus. The posterior bony wall of the meatus is taken down as far as necessary to overlook the cholesteatoma completely. In the second type of cholesteatoma more infiltrative growth of the matrix can be observed. Here it has an irregular surface and portions of cholesteatoma fill the cells and niches of the retrotympanic spaces. In this more dangerous type of cholesteatoma every remnant of the matrix has to be meticulously removed under the microscope.

Tympanoplasty in a Discharging Ear

Most patients coming to hospital for ear surgery have been under the continuous care of an E.N.T. specialist up to the time of admission. Even so, many of them still have a moderate or heavy aural discharge. Antibiotic treatment, in spite of sensitivity studies, rarely stops the secretion or reduces the inflammatory changes of the tympanic mucosa. After Mr. Thorburn and Dr. Verhoeven visited our institution and after we came to know about the work of Mr. McGuckin we paid special attention to these wet ears. If the discharge is copious we deal with this by daily suctioning and removal of polypi before the operation. In some instances it is possible to considerably reduce the inflammation in the attic and tympanum proper by these means. In young people, however, the discharge is often resistant to this kind of conservative treatment, most of all in mesotympanic otitis media. If the attempts to get a dry ear before surgery

fail, there is the possibility of the flap being lifted from the perforation by pressure of the secretion in the middle ear. In such cases we drain attic and antrum through a drillhole in the mastoid plane. A tube leads the secretion to the outside. Through this tube it is possible to irrigate the antrum with antibacterial solutions or to ventilate the middle ear if the patency of the Eustachian tube is interfered with by swelling of the mucous membrane. The plastic tube is removed after suppuration has ceased, which in our experience takes 6 to 10 days. If necessary, the drillhole in the mastoid cortex may be enlarged and a simple mastoidectomy performed. The posterior wall of the external canal should not be touched in order to preserve its natural shape and prevent the necessity of regular cleanings for the rest of the patient's life.

Remarks Concerning the Type IV Tympanoplasty

In a tympanoplasty type IV there is not only considerable destruction of the ossicular chain but the mucous membrane of the middle ear is generally in poor condition also. Early and regular inflations are required to prevent adhesions and to insure good functional results. If the entire tympanic cavity has been covered with one single large graft, there is a danger of the air stream passing beyond the round window niche towards the oval window. A common airspace will connect the tube with both windows. Consequently poor hearing will result. To avoid this complication we first cover the Eustachian tube, hypotympanum and round window niche with one large piece of skin. After removal of the mucosa over the oval window it receives its own covering by a second small graft. With this technique even excessive inflations in the first post-operative days or later are of no harm. It is possible that the still loose transplant gets detached over the hypotympanum, but it will rapidly adhere again to its base. In any case the oval window remains covered by its own small flap. Conservation of cholesteatoma matrix over the oval window is to be recommended in rare instances only. Usually the underlying mucosa is thickened and often contains cysts filled with a yellowish liquid. In these cases we prefer to remove the matrix along with the underlying mucosa from over and around the oval window and cover this area with a small meatal graft.

In infected ears we have not had any good results from the interposition of plastic tubes in the type IV attempting to convert a type IV into a type III tympanoplasty. In almost 200 cases of otosclerosis we have replaced the stapes by a plastic tube and no adverse reactions have been observed so far. It seems that foreign material should not be used if there is inflammation in the middle ear. In some cases a plastic columella was placed in the middle ear with good results after healing had first been completed.

Problems of Tympanoplasty

Tympanoplasty in Radical Cavities

Sometimes the revision of a radical cavity and performance of a tympanoplasty is quite gratifying. This should be considered if there is a purulent aural discharge or the hearing is greatly reduced. We have done revisions of radical cavities in 94 patients who had had a persistently running ear. In 68 per cent. the secretion originated predominantly from the tympanic cavity or the Eustachian tube. In the remaining 32 per cent. there were granulations in the mastoid cavity. The revision consisted of complete removal of the diseased epithelium and any cells which had been missed in the first operation. If cochlear function was still good the tympanum was then covered with a meatal graft according to the principles of tympanoplasty. In cases with poor cochlear function tympanic mucosa was removed by curetting. The Eustachian tube was also curetted as deeply as possible in order to assure good healing of the transplant. The result was surprising: 90 out of the 94 patients obtained dry ears. Disappointing, however, are the results of revisions of wet cavities as far as hearing is concerned: only 48 per cent. of our patients reached a serviceable hearing level. In a dry radical cavity with a severe hearing loss and good bone conduction, adhesions in the hypotympanum or no pressure difference between round and oval window are usually found. In cases of hypotympanic adhesions the connection between the tympanic orifice of the Eustachian tube and the round window is re-established by lifting up the epidermal layer. Early inflations are imperative, starting on the first post-operative day, otherwise the adhesions will form again. In five out of 13 cases we saw recurrent adhesions. In 10 cases both windows were in continuity with the air-space from the Eustachian tube and covered by a pseudomembrane adherent to the promontory. This membrane was mobilized towards and around the oval window and brought in contact with the promontory. The mucous membrane in the oval window niche is taken out and the footplate covered with a patch of meatal skin again.

Treatment of the Eustachian Tube; Tympanoplasty with a Closed Eustachian Tube

The most frequent cause of an unsuccessful tympanoplasty is partial or even complete closure of the Eustachian tube. Before surgery we impress on our patients the importance of adequate middle-ear ventilation and teach them how to do the Valsalva manœuvre. Even children under 10 years will usually learn how to inflate their tubes. In children and adults below the age of 20 sometimes radiation of the tubes with X-rays had been helpful. We apply a total of 300 roentgen in 10 sessions at intervals of one week.

We have no experience with the application of Strontium 90 as described by Zöllner, neither with dilatation of the tube with bougies.

Surgical widening of the tube is a procedure of value in rare cases only. Zöllner mentioned the placement of thin plastic tubing into the Eustachian tube. The plastic tube is removed from the nasopharynx after several weeks. This method was tried in some cases but tubal patency could never be maintained. Invariably two or three months later the tube was closed again. Today, if tubal patency cannot be established, we cover the middle ear with a meatal graft and intentionally leave a perforation over the round window. The patient is instructed to keep this perforation covered with a moist cotton ball. In this technique it is of importance to remove the tympanic mucous membrane in order to prevent annoying suppuration due to unavoidable infection. If the middle ear is lined with epithelium as is frequently the case in such patients, grafting is not necessary. The hypotympanum is covered with a moistened cotton ball in such a manner as to ensure a small air bubble in the round window niche allowing vibration of the window membrane.

Without any doubt this method is an unsatisfactory substitute but we have no other choice.

Hals-Nasen-Ohrenklinik Medizinische Akademie,
Duesseldorf, Moorenstr. 5

EXPERIENCE WITH PEDICLED TEMPORAL MUSCLE FLAPS IN RADICAL MASTOID AND TYMPANOPLASTY OPERATIONS*

By I. B. THORBURN (Blackpool)

IN MY Yearsley Memorial Lecture of March 1960, entitled "A Critical Review of Tympanoplastic Surgery", I stated that control of healing was the most important single problem influencing the future status of tympanoplasty. I also referred to the work of Rambo and Kisch describing the use of pedicled temporal muscle flaps. In this short paper I wish to present a provisional report of my experience during the past year with pedicled temporal muscle flaps and the influence which these appear to have had upon the facility and security of healing after radical mastoid, modified radical mastoid and tympanoplasty operations.

The method which I shall later describe in some detail, seems to depend for its success and indeed for its acceptance, upon the adjustment of certain of the basic principles which have hitherto guided us in major temporal bone surgery. These amended principles will now be briefly stated.

(1) If the surgeon is confident that he has eliminated chronic disease from the mastoid, it is not necessary on grounds of safety or long-term after-care to leave the cavity completely accessible from the external auditory meatus.

(2) It is not only permissible but advantageous to obliterate an abnormal dead space in the temporal bone with vascular soft tissue, such as a pedicled temporal muscle flap.

(3) The introduction of vascular soft tissue exerts a beneficial healing influence on the tympano-mastoid cavity.

(4) The prospects of survival in a natural healthy condition of the full thickness free skin graft used for a Wullstein type of tympanoplasty should be excellent if at least 50 per cent. of the skin graft beyond the tympanum lies on a vascular, preferably soft tissue bed.

I have discussed this last statement with Mr. Eric Peet, the plastic surgeon at Oxford, and he agrees that under these conditions a skin graft covering the tympanum should derive an adequate capillary blood supply within 72 hours. It is my opinion that there are two main reasons for the

* Paper presented to the Section of Otology, Royal Society of Medicine, on February 3rd, 1961.

commonly experienced breakdown of an initially healed tympanoplasty operation. First, although the graft appears to survive, it suffers a degree of anoxia in the first few weeks which determines its ultimate gradual degeneration. Secondly, the presence of even a small recessed mastoid cavity provides a convenient "test tube" in which debris collects and pathological organisms readily flourish.

It will be already apparent to those of you who have read Rambo's articles, that while I have been considerably influenced by his ideas, I have developed the application of these ideas along somewhat different lines. This arose in two ways. First, I had a good deal of experience with Wullstein's method of tympanoplasty and while I was frankly disappointed with my failures, there remained a certain number of ears with satisfactory healing. I felt it was better, if possible, to modify this method in the light of experience and not to scrap it. Secondly, before I undertook ambitious reconstructive hearing improvement operations by this method, I had to build up confidence from personal experience that the principles underlying it were sound.

I therefore selected cases of failed healing after tympanoplasty, radical or modified radical mastoid operations, in which the main factor determining the failure of healing was the unhealthy state of the mastoid cavity. These were all cases to whom ordinary otological practice, whether conservative or surgical, had little or nothing to offer. I can report to you on 17 such cases, operated on throughout the past year and followed up now for an average of 8·4 months (Table I). The detail of technique will be given later. It should be noted that in this group no attempt was made to close the tympanum either with muscle or skin grafts. In all 17 cases the mastoid cavity healed, usually within 4 to 6 weeks. In three cases there was some residual tympanic infection, one of these going abroad before completion of treatment.

There were six other cases treated in a similar manner. These were primary as distinct from revision operations, three radicals and three modified radical mastoid operations (Table II). The mastoid cavity healed and was obliterated in five, but was unsatisfactory with persistent discharge for 6 months in one. The tympanum appeared secure in four and somewhat unstable in two.

The third group of four cases had this feature in common, that the tympanum after dissection, was closed with a pedicled muscle flap partly covered by an anterior meatal skin flap (Table III). All four healed beautifully within 6 weeks and one had successful fenestration 3 months later.

The final group contains nine cases treated with pedicled temporal muscle flaps combined with tympanoplasty using a full thickness postauricular skin graft (Table IV). Here a main objective was to conserve and improve hearing. One skin graft was lost because of an unrecognized

hæmatoma, yet the ear healed with a good drum; the other eight survived in a remarkably healthy state. One graft retracted from the meatal wall leaving a small anterior perforation. The hearing results were encouraging and the operation was so designed that a fenestration of the lateral semicircular canal could be carried out later. This was done in one case but with no immediate benefit.

There were two additional cases in which a split skin graft was used in place of a full thickness graft. In both the mastoid disease was controlled but the new drum perforated with some relapsing tympanic infection.

OPERATIVE TECHNIQUE

INCISION AND EXPOSURE: Extension of an ordinary endaural incision upwards and backwards for about one inch gives adequate exposure of the temporal muscle and fascia. If the meatal skin is intact it is incised at 12 o'clock and 6 o'clock down to the level of annulus and the whole posterior half of the meatal skin is dissected outwards as a pedicled flap. This flap is in continuity with the conchal skin and includes periosteum of the outer meatus and mastoid. If there has been a previous radical type of mastoid operation, any healthy skin in the meatal aspect of the mastoid cavity is conserved. In certain circumstances the anterior meatal skin may also be dissected forwards as a pedicled flap.

DESIGN OF PEDICLED TEMPORAL MUSCLE FLAPS: Let us now assume that the tympano-mastoid cavity has been fully opened up and all disease removed. Special diagrams have been devised to illustrate the problem involved in the design and employment of temporal muscle flaps. In the key diagram (Diagram 1) the squamous temporal bone covered by temporal muscle and fascia is in normal perspective. On the other hand the planes of tegmen, mastoid outline and anterior meatal wall, which bound the tympano-mastoid cavity, have been somewhat opened out in relation to the tympanum. One cannot, on a flat diagram, convey an impression of the capacity of the tympano-mastoid cavity. This may give some idea of the surface areas involved and especially the size and depth of the tegmen. For clarity, the superficial soft tissues including auricle and external auditory meatus, have been omitted.

The continuous line in Diagram 1 outlines a temporal muscle flap pedicled anteriorly as advised by Rambo. On swinging the flap down (Diagram 2), making some allowance for shrinkage, it usually only covers part of the tegmen and reaches the upper aspect of the mastoid or tympanum. For my purpose a larger and longer flap is usually required. This is readily obtained by pulling down and cutting free additional muscle from above the level of the incision through the temporal fascia as shown by the dotted line in Diagram 3. This extra muscle is freed proximally from the pedicle but retains its attachment distally together with its blood

supply (Diagram 4). It easily reaches and can be manipulated to fill the whole mastoid cavity.

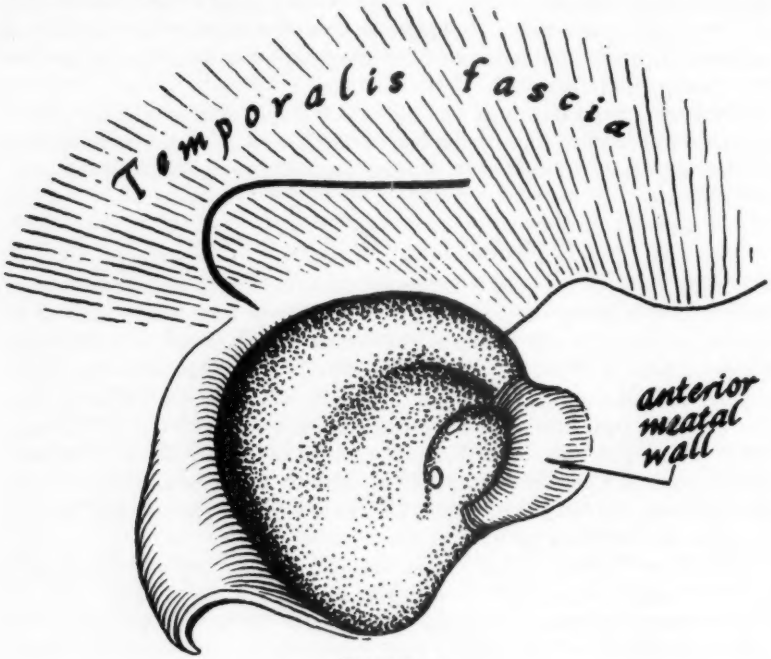


DIAGRAM 1.

(Key Diagram—see text.)

Stippled area represents tympano-mastoid cavity. Posterior meatal skin flap is dissected and everted. Anterior meatal skin is intact.

EMPLOYMENT OF PEDICLED TEMPORAL MUSCLE FLAPS: If it is desired to obliterate the mastoid cavity leaving the tympanum accessible (Tables I & II), one only need fill the mastoid cavity with muscle, cover it with the

TABLE I.

MATERIAL—17 cases.
Failed healing of mastoid cavity.

PROCEDURE

Disease exenterated.
Temporal muscle to mastoid and tegmen.
Tympanum not covered.

RESULTS

Mastoid cavity healed.. ..	17
Mastoid cavity obliterated ..	14
Tympanum secure	14
Tympanum unstable	3

TABLE II.

MATERIAL—6 cases.
Primary operations.
3 radical and 3 modified radical mastoids.

PROCEDURE
Disease exenterated.
Temporal muscle to mastoid and tegmen.
Tympanum not covered.

RESULTS

Mastoid cavity healed	5
Mastoid cavity obliterated ..	5
Unsatisfactory after 6 months	1
Tympanum secure	4
Tympanum unstable	2

posterior meatal flap (Diagram 5), support the meatal outline with a light pack and suture the endaural incision. Remember that you do not have a mastoid cavity, so there is no problem in fashioning grafts or skin flaps to help it to epithelialize. Indeed you should finish with a slightly larger

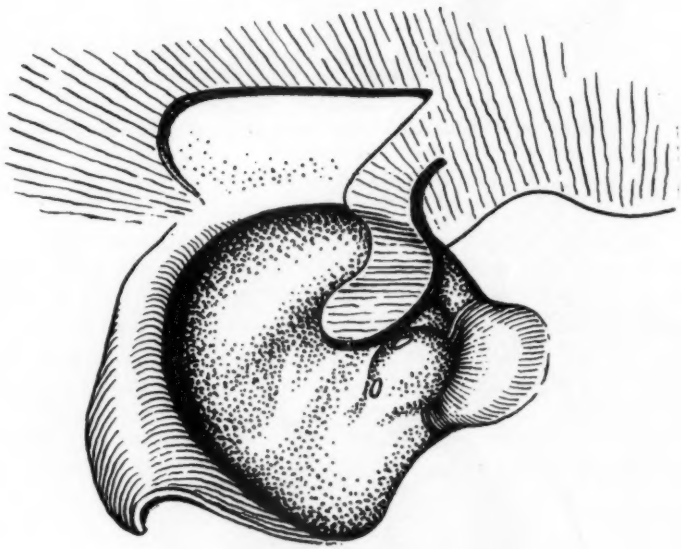


DIAGRAM 2.
Simple but inadequate pedicled temporal muscle flap.

than normal meatus, so if the skin was there to start with, as in a primary operation, it should be adequate. Some skin grafting may be necessary to guard against stenosis due to the thickness of the temporal muscle pedicle at the outer and upper meatal level.

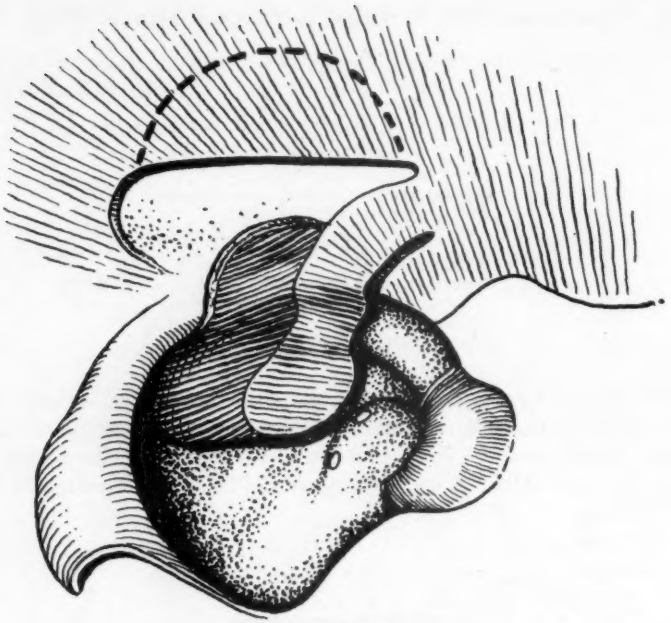


DIAGRAM 3.

Pedicled flap includes extra muscle from area outlined by dotted line.

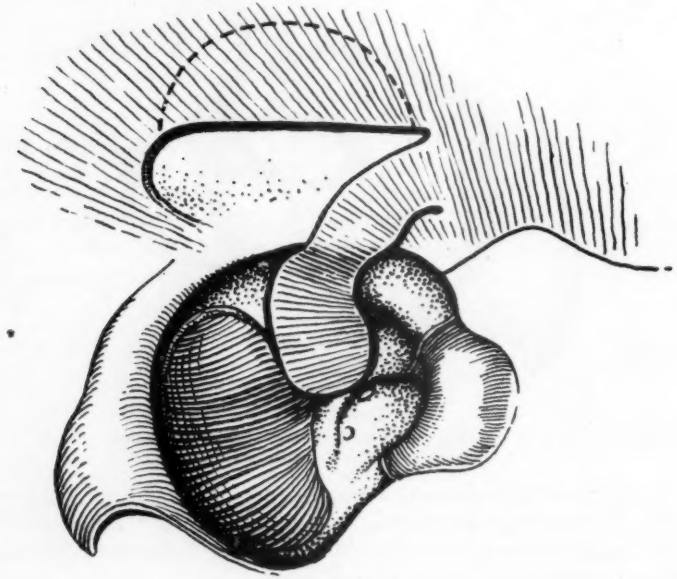


DIAGRAM 4.

Extended pedicled temporal muscle flap easily reaches and fills the mastoid cavity.

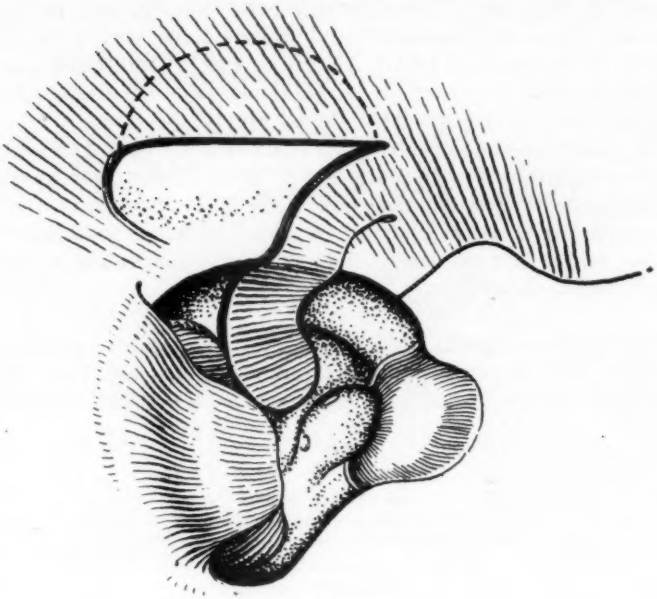


DIAGRAM 5.
Posterior meatal skin flap covers the muscle filling the mastoid cavity.

If you wish to use the temporal muscle flap to close the tympanum (Table III), then you must decide whether you intend, either to go back later and perform a fenestration operation, or simply to carry out a radical obliterative operation. If the former, one might reasonably employ Rambo's muscleplasty technique or some variation of it. In my hands this has involved raising an anterior meatal skin flap and fashioning a relatively narrow pedicled temporal muscle flap. To make it long enough to cover the tympanum and reach the anterior and inferior meatal walls, it may have to be extended by turning down part of the temporal fascia

TABLE III.

MATERIAL—4 cases.
2 Primary radical mastoids.
2 Rambo type muscleplasties.

PROCEDURE
Temporal muscle closure of tympanum in 4
and of mastoid in 3.

HEALING
All healed within 4 to 6 weeks.
Fenestration operation 3 months later in 1.

as shown in Diagram 6. The anterior meatal skin flap now partly covers the muscle flap over tympanum, while the posterior meatal flap fits in to the back of the mastoid cavity. It can be left to epithelialize, or a skin graft may be placed to cover the lateral semicircular canal extending on to the muscle over the tegmen for its blood supply.

If the object is a radical obliteration of the whole cavity then you must include enough muscle with the pedicled flap to fill the mastoid and cover the tympanum. The two meatal flaps are fitted over the muscle with very little supporting packing (Diagram 7). Healing should take place readily in a few weeks, leaving only a shallow meatal depression in place of a radical mastoid cavity.

TYMPANO-MUSCLEPLASTY: The design of a skin graft tympanoplasty, associated with a pedicled temporal muscle flap, can now be easily appreciated (Table IV). The name TYMPANO-MUSCLEPLASTY is

TABLE IV.

MATERIAL—9 cases.
Primary—7 Revisions—2
Chronic Otitis Media—6 Tympanosclerosis—3

PROCEDURE
Disease exenterated.
Temporal muscle to mastoid and tegmen.
Full thickness skin graft to tympanum and muscle.

HEALING
Mastoid healed and obliterated—9.
Skin graft healthy in 8 and failed in 1.
Small anterior perforation in 1.

HEARING
Below 30 Db. (average 25 Db.)—6
Below 40 Db. (average 35 Db.)—1
Below 50 Db. (average 46 Db.)—2

suggested and this operation is reserved for ears with a major loss of the tympanic membrane, yet having conditions favourable for a Type 2, more usually a Type 3 or a subsequent Type 5 tympanoplasty. I would strongly advise against trying to combine this operation with an immediate fenestration of the lateral semicircular canal, since it is not possible adequately to control the fenestra. Where there is a limited loss of the drum, with an intact ossicular chain and a healthy tympanum, I still prefer an extended myringoplasty operation using a meatal skin graft.

After clearing any "irreversible pathology" from the mastoid and tympanum, the operation proceeds in the following way. An extended pedicled temporal muscle flap is fashioned as previously described (Diagram 4), to cover the tegmen and fill the mastoid cavity. Then a post-auricular full thickness skin graft is prepared. It fits the remaining deep part of the

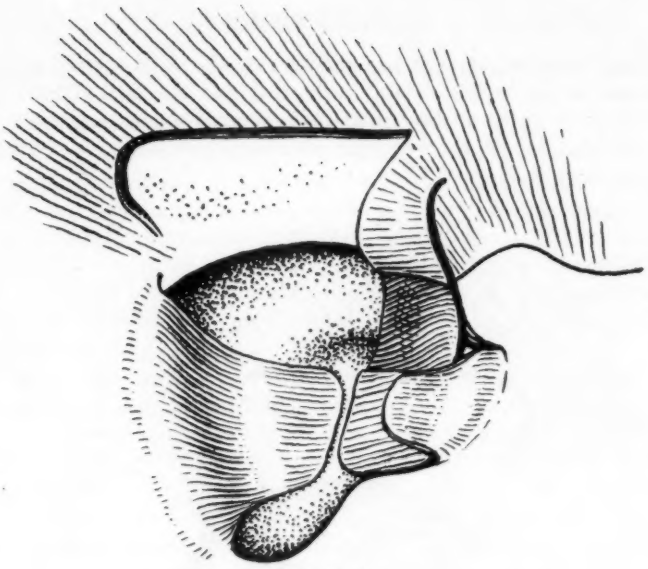


DIAGRAM 6.

Fascial extension of narrow pedicled temporal muscle flap is used with anterior meatal skin flap to close the tympanum.

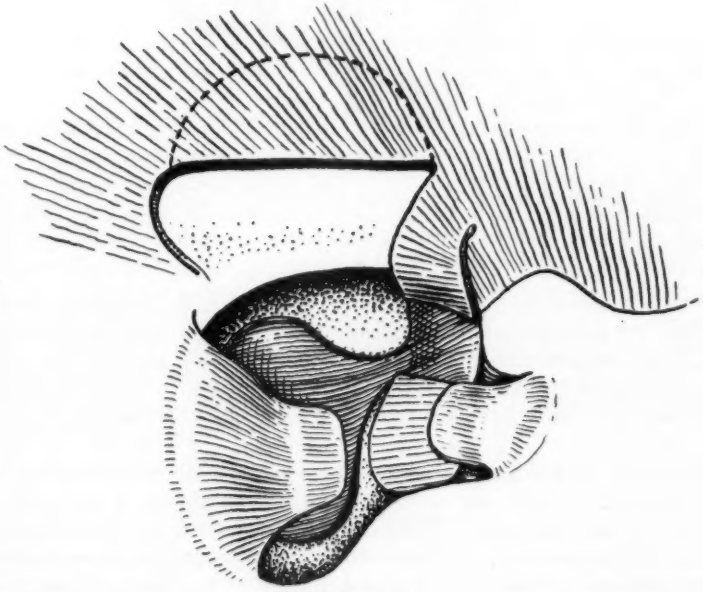


DIAGRAM 7.

Large pedicled temporal muscle flap with extensions to fill mastoid and close tympanum. Anterior and posterior meatal skin flaps in position over muscle.

meatal wall from which skin has been removed and is carried across the tympanum as far as the medial attic wall and the lateral semicircular canal (Diagram 8). From here it passes outwards so that fully half of the skin graft area lies on the vascular muscle pedicle covering the anterior part of the tegmen.

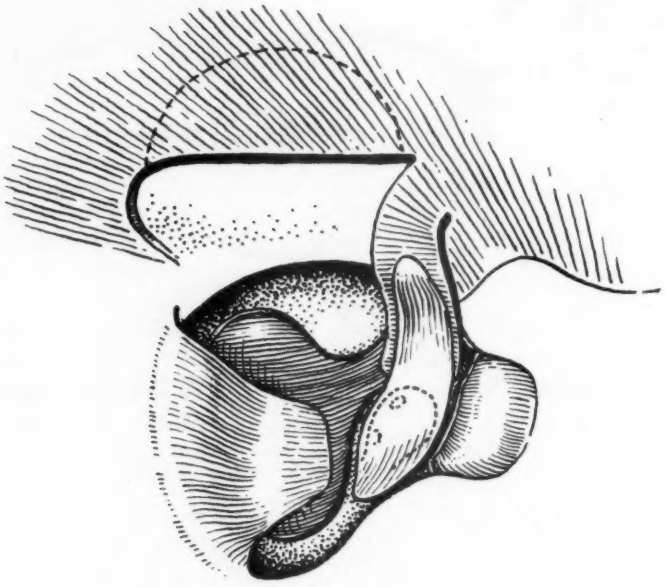


DIAGRAM 8.

Tympano-muscleplasty. Posterior meatal skin flap covers muscle in mastoid. Half of the full thickness skin graft used for the tympanoplasty extends over the muscle pedicle from which it should derive a rich blood supply.

It will be found on removing the retractor that the posterior meatal skin flap, the skin graft and the anterior meatal skin come together and provide a complete cover for what now looks like a slightly expanded external auditory meatus. A supporting pack is gently introduced and the endaural incision is sutured with drainage to the temporal muscle area.

After-care: The drain is removed in 48 hours without disturbing the main dressing. A seven day course of antibiotic is given. A few patients complain of pain above the ear on chewing but it settles in a few days. At the first dressing a week after operation the stitches and outer packing are removed and a small pack replaced to support the meatus for another 5 days. Thereafter local cleaning out, or the application of drops or pow-

ders to the ear, are strongly discouraged but the patient may change clean cotton wool once or twice daily. After 10 days gentle inflation of the tympanum by Valsalva's method or by Politzerization can be started.

Small granulations may develop especially at the lines of junction between the graft surfaces; these can be picked off with fine forceps and touched with Trichloracetic Acid. In the majority the nice feature is that very little aftercare is needed and secure healing takes place in from 4 to 6 weeks. The tympanic skin graft should quickly assume a fresh pink colour and retain the appearance of healthy full thickness skin with no tendency to desquamate or to degenerate. This to me has been a new and encouraging experience.

I realize that what I have said is open to criticism especially on the charge of the danger of burying disease. I am prepared to take responsibility for my own assessment of the adequacy of the exenteration of disease which must precede obliteration of any part or the whole of the tympano-mastoid cavity. This is a provisional report; the immediate results seem good but there may be a day of reckoning. I would plead with anyone who adopts this technique to be extremely meticulous about the assessment and eradication of disease before he accepts the responsibility of closing the cavity with muscle.

Summary

This is a provisional report on various ways in which pedicled temporal muscle flaps have been employed during the past year in an attempt to secure better control of healing after radical mastoid, modified radical mastoid and tympanoplasty operations. It is considered not only permissible but advantageous to obliterate the mastoid cavity alone, or even the whole tympano-mastoid cavity, provided that disease has been adequately removed. Encouraged by results of revision operations, the technique has been developed so that the skin graft as employed for Wullstein types of tympanoplasty, derives an early and adequate blood supply from the vascular temporal muscle. The skin graft has retained such a healthy appearance that it is felt that the principle of providing a vascular soft tissue bed for part of the graft contributes towards greater security of healing after tympanoplasty operations.

It is proposed that the name TYMPANO-MUSCLEPLASTY be given to this new operative technique.

Acknowledgement

I am greatly indebted to Mr. D. P. Hammersley, artist attached to the Department of Surgery, University of Durham, for the care and trouble he has taken in preparing the illustrations for this article.

REFERENCES

KISCH, H. (1932) *Postgrad. med. J.*, **8**, 270.
PEET, E. Personal Communication.
RAMBO, J. H. T. (1958) *Trans. Amer. Acad. Ophthal. Otolaryng.*, **62**, 166.
——— (1960) *A.M.A. Arch Otolaryng.*, **71**, 428.
THORBURN, I. B. (1960) *J. Laryng.*, **74**, 453.

160 Whitegate Drive,
Blackpool

IS MYRINGOPLASTY WORTHWHILE?*

By PHILIP H. BEALES (Doncaster)

I WOULD like first of all to thank our President for giving me the opportunity of presenting this short paper today.

For some time now as a result of various talks I have had with colleagues who have visited my Theatre it has been clear to me that there is a great variation in the results of plastic ear operations. The operation of myringoplasty is one that is praised by some and condemned by others. It occurred to me that you might be interested in my theories as to why there should be such a variation in results.

Although I regard myringoplasty as primarily an operation to repair a defect in the ear-drum in an ear that is free of infection, it is also, in every case, an operation in which the whole of the tympanic cavity and its contents are examined and tested under the direct vision of the microscope.

It is thus not a minor exercise for the trainee surgeon but a comprehensive and difficult procedure that may well tax the skill of the most experienced otologist.

The operation is never carried out unless the ear has remained free of infection at repeated examinations over a period of at least twelve months, and the indications I adopt when this fundamental condition is fulfilled are shown in the following table.

TABLE A.

INDICATIONS FOR MYRINGOPLASTY.†

1. DEFECTS OF TYMPANIC MEMBRANE WITH RECURRENT ATTACKS OF OTITIS MEDIA THAT ARE BELIEVED TO BE DUE TO INFECTION FROM WITHOUT e.g. EAR DISCHARGE AFTER SWIMMING.
2. DEFECTS OF TYMPANIC MEMBRANE WITH APPRECIABLE HEARING LOSS.
3. DEFECTS OF TYMPANIC MEMBRANE ASSOCIATED WITH VERTIGO.
4. WHEN PATIENT IS REJECTED FOR AN OCCUPATION ON ACCOUNT OF A TYMPANIC MEMBRANE PERFORATION.
5. ALL TRAUMATIC PERFORATIONS THAT DO NOT HEAL QUICKLY.
6. TYMPANIC MEMBRANE PERFORATIONS AND ASSOCIATED TYMPANOSCLEROSIS.

†In all cases Tympanic Mucosa must be normal at several examinations over a period of at least twelve months.

* Paper presented to the Section of Otology Royal Society of Medicine on February 3rd, 1961.

I have tried with this operation and in fact all tympanoplastic procedures to apply all the basic principles of plastic surgery to a sound otological operation.

This may sound simple but I wonder if those who are unsuccessful in these operations do in fact combine the two specialties completely? I have used a free skin graft usually a full thickness one in my cases, and the results show that in about 60 per cent. of operations there has been reasonable hearing improvement which is maintained over the years, and in about 90 per cent. of cases the ears have remained dry. When using free skin grafts certain basic principles must be adopted if the graft is to take and survive indefinitely.

The basic principles are shown in the following table:

TABLE B

BASIC PRINCIPLES OF FREE SKIN GRAFTING.

1. Scrupulous care to avoid infection at operation.
2. The preparation of a suitable graft.
3. The application of the free graft to a suitable bed.
4. Prevention of bleeding beneath the graft after application.
5. Prevention of trauma to the graft until it is well vascularized.
6. Prevention of infection of the graft after application.

I will now enlarge on these basic principles:

(1) I do not need to emphasize that asepsis at the time of operation is of vital importance and penicillin does not absolve us from the responsibility of taking great care not to introduce infection at the time of operation. The same care should be taken as, for example in a fenestration operation.

(2) The preparation of a suitable graft is an essential. A full thickness post-auricular skin graft is frequently used as it is convenient to take and the quality of skin it provides is good. This type of graft must be entirely free of fat if it is to take properly. The trimming of the fat from the graft requires time and patience and the raw surface of the graft should always be examined with the microscope before it is applied. It is very instructive to do this and makes one realize that it is in fact very easy to leave islands of fat on the graft and thus make the chances of 100 per cent. take less certain.

It is easy to damage the graft in its preparation and skin hooks and not forceps should be used when handling it.

(3) A free skin graft must be applied to a suitably vascular bed if it is to take completely and if it is to survive indefinitely and complete hæmostasis must be present when the graft is applied to its bed.

Hæmostatis is obtained by combining a suitable general anæsthetic with a local injection of a vasoconstrictor and the application of a topical vasoconstrictor immediately before the graft is applied to its bed.

The drawings show the four sites for the injection of the local anæsthetic adrenalin solution.

In practice the most satisfactory solution has been found to be about 2·5 c.cs. of a mixture of 3 c.cs. 2 per cent. xylocaine and 1 c.c. of 1/1000

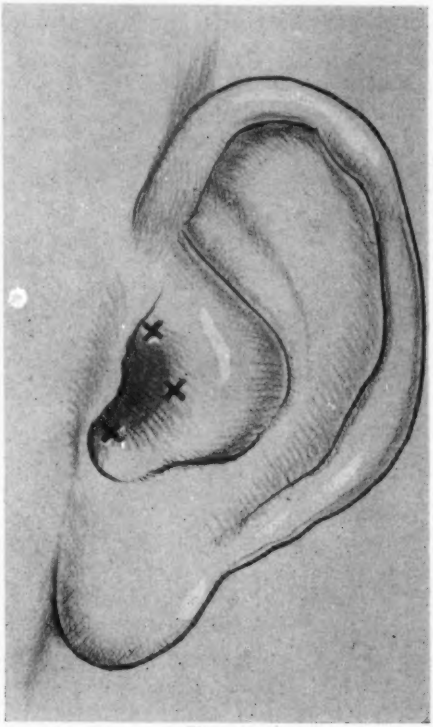


FIG. 1.

Three of the four sites for injection of local anæsthesia.
See caption Fig. 2.

adrenaline. The concentration of adrenaline in this mixture would be regarded as too high by the physiologists but weaker concentrations have been less effective.

An endaural incision is used and the incision on the posterior meatal wall is not carried too close to the annulus.

The skin of the deeper part of the posterior meatal wall is very thin and it is easily destroyed if a periosteal elevator is used to raise it at this level. The skin of the outer two thirds of the posterior meatal wall can be elevated readily as it is thicker, and it is this skin which is included in the meatal flap held by the retractor. The thin skin is handled under direct

vision using the microscope and by doing this one is able to preserve portions at least of the periosteal layer of the deep bony meatus. The free graft will later be in contact with this part of the posterior meatal wall

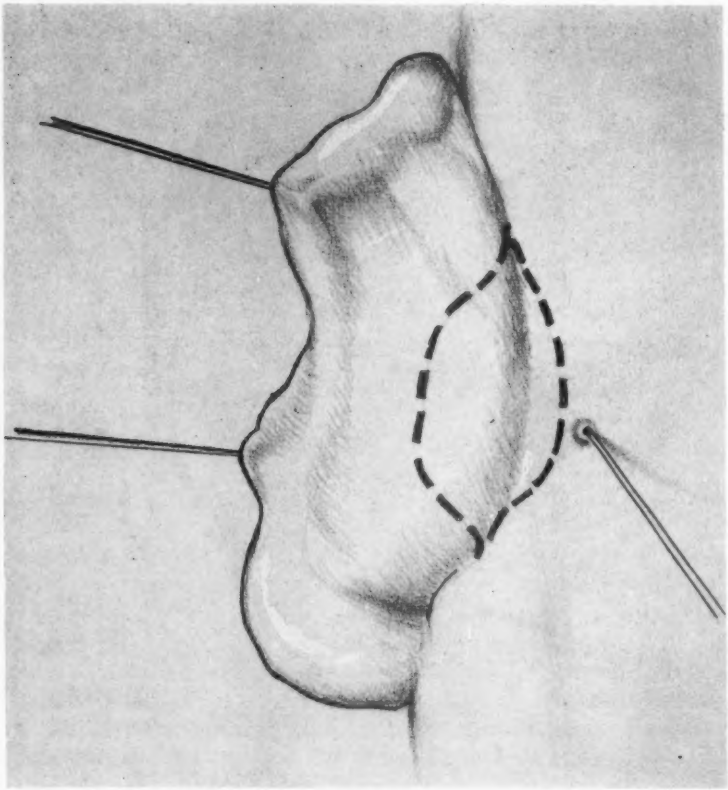


FIG. 2.

SITES FOR INJECTION OF LOCAL ANÆSTHETIC ADRENALIN MIXTURE.

The four sites for injection of two to three c.cs. of a mixture of three c.cs. 2 per cent. xylocaine and one c.c. of 1/1000 adrenalin. This mixture is used combined with general anæsthesia for all aural operations and gives better hæmostasis than the weaker adrenalin concentrations that are usually employed. When cutting a post-auricular graft it is important to avoid puncturing the skin that will be used for the tympanic membrane repair with the needle used for the local injection.

and more blood vessels will remain to nourish the graft if this technique is adopted. In a similar way the skin that is removed as a strip from around the rest of the deep meatal wall at its junction with the annulus is removed gently so that the periosteum is in part preserved. Complete preservation

of periosteum is not possible as the skin is partly fused with it at this level of the meatus.

(4) A moderate pressure dressing at the end of the operation helps to

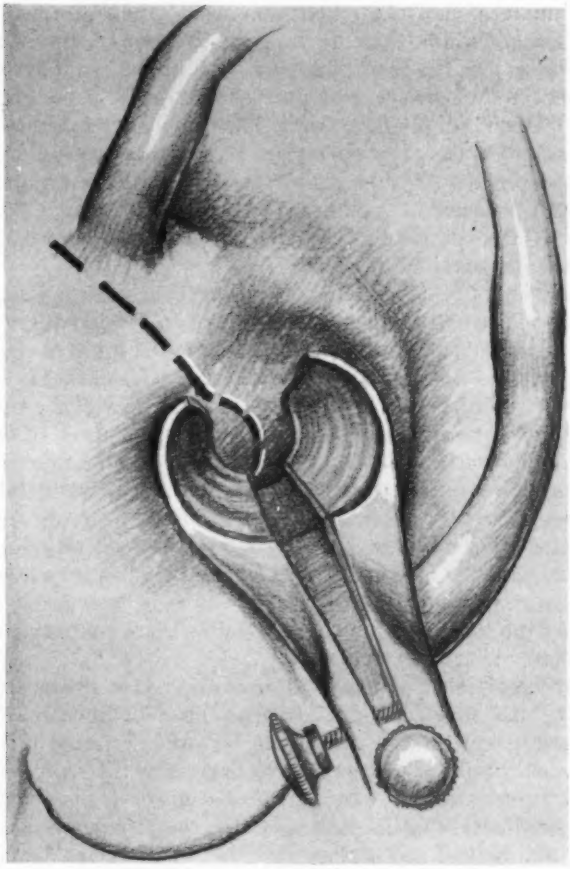


FIG. 3.

ENDAURAL INCISION USED FOR MYRINGOPLASTY.

The incision of the posterior meatal wall skin should not be carried too close to the tympanic annulus. The skin of the deeper part of the posterior meatal wall is very thin and should only be handled under magnification. It is liable to be torn and destroyed if handled with an elevator.

immobilize the part and reduces oozing of blood if the defect is vascular. Too much pressure can theoretically be applied over a hard defect and

prevent the graft from taking because of ischæmia. In fact this is very difficult to produce as the pressure under a dressing rapidly reduces. An inner dressing of moist gel foam on the outer surface of the graft and an outer dressing of BIPP gauze has proved satisfactory.

(5) It is vital to prevent trauma to the graft until it is well vascularized. In practice this means that all methods that stretch the graft must be avoided.

Most damage will be done by too early inflation of the ear after operation. This stretches the graft and tears some of the blood vessels carrying nourishment to it. The central part of the graft in the tympanum is receiving its blood supply from the periphery only and it is very vulnerable for at least two weeks after operation. Myringoplasty should not be done at all if the Eustachian tube is obstructed, and if the tympanic mucosa has not been damaged at operation and if the graft is supported by a little gelatin foam in its central portion, nothing will be gained by early inflation. It is not usually required at all.

(6) Infection of the graft after operation occurs in two ways. The graft may be applied to a bed which is infected, where it will not take unless the infection is controlled by antibiotics or it may be infected, from without by the collection of discharge on its skin surface. The first is easy to deal with and the second is caused by an error on the part of the surgeon.

If any raw surfaces, however small, are left at the end of operation to heal by granulation, discharge will occur and this often becomes infected. The discharge lies on the surface of the graft and causes inflammation which may destroy the graft.

Complete cover of all raw areas at the end of operation is relatively easy to achieve after myringoplasty as no cavity has been created in the mastoid.

Here lies the essential difference in healing between myringoplasty and tympanoplasty with a mastoid cavity.

In myringoplastic procedures a free skin graft if applied correctly should take and survive, but in tympanoplasty with a mastoid cavity one cannot prevent the free graft from becoming infected if it is applied to the mastoid cavity as well as the tympanum, as free skin grafts will not take properly on bare bone. Spontaneous healing or healing by granulation of the mastoid cavity again does not solve the problem as this is a slow and uncertain method and it allows infected discharge to damage the free tympanic graft.

Therefore for tympanoplasty with a mastoid cavity a flap with its own blood supply is necessary for lining the mastoid cavity, or a method such as Ian Thorburn has shown today is essential for success.

I hope that more otologists will come to realize that the so called problem of the unhealed mastoid cavity is largely one of their own creation and will use methods that ensure sound healing. I will now discuss my results of myringoplasty operations.

Examination of Results:

TABLE I.

HEARING RESULTS AFTER MYRINGOPLASTY.

87 OPERATIONS BETWEEN MAY, 1955 AND JULY, 1960.

Hearing improved in ..	46 cases.
Hearing unchanged in ..	30 cases.
Hearing worse in ..	2 cases.
No record of hearing in ..	9 cases.

HEARING RESULTS EXPRESSED AS A PERCENTAGE.

Hearing improved in ..	59 per cent.
Hearing unchanged in ..	38 per cent.
Hearing worse in ..	2 per cent.

Table I shows that a useful hearing gain has been obtained in about 60 per cent. of cases. The improved hearing level seems to be maintained over the years.

TABLE II.

ANALYSIS OF HEARING GAIN EXPRESSED AS AVERAGE FOR SPEECH FREQUENCIES 500, 1000, 2000 C.P.S.

Over 10 decibels gain	11 cases or 24 per cent.
Over 15 decibels gain	13 cases or 28 per cent.
Over 20 decibels gain	10 cases or 22 per cent.
Over 25 decibels gain	4 cases or 9 per cent.
Over 30 decibels gain	8 cases or 17 per cent.

Table II shows the amount of hearing gain for the speech frequencies and one should note that there is a significant group with a hearing gain of over 30 dbs. These cases showed additional lesions such as a broken ossicular chain, or a fixed stapes. These lesions would have been missed if a blind operation without a complete examination of the ossicular chain had been carried out.

TABLE III.

PREVIOUSLY REPORTED RESULTS OF MYRINGOPLASTY.

Author	Operations	Takes	Hearing		
			Improved	Unchanged	Worse
WRIGHT 1956 (10 cases hearing not tested)	56	40	25	5	0
BEALES 1957	17	16	12	5	1
MAWSON 1957	21	21	15	6	0
THORBURN 1960	17	17	14	1	2

Table III shows the results of other surgeons. One should note the high incidence of primary failure of the skin graft in Wright's series. This should be uncommon with a suitable technique.

TABLE IV.

TYMPANIC PATHOLOGY FOUND AT 87 MYRINGOPLASTY OPERATIONS.

Tympanosclerosis	3 cases.	
Otosclerosis	2 cases.	
Fixed Stapes	5 cases.	2 otosclerosis 1 tympanosclerosis 2 fibrous adhesions
Interruption of Ossicular Chain at Inco-Stapedial Joint	8 cases.	
**Thickened Mucosa in Tympanum*	6 cases.	

*5 of 6 cases with thickened tympanic mucous membrane broke down later and two of these required Tympanoplasty.

N.B.—In 27 per cent. of cases abnormalities were found. This should condemn the blind operation carried out through an aural speculum in which the tympanum is not examined.

Table IV is of special interest as it shows that in no less than 27 per cent. of cases, a lesion other than a defect of the drum was found. This finding is a condemnation of the blind operation in which the whole chain is not examined at operation.

When the chain is found to be interrupted at the inco-stapedial joint, I apply the graft so that it lies in contact with both the remains of the long process of the incus and the head of the stapes as seen in the two drawings.

This procedure gives a better functional result than if the graft is applied to the head of the stapes only, as in the type 3 tympanoplasty, as one retains the lever action of the ossicles.

TABLE V.

HEALING RESULTS 87 MYRINGOPLASTY OPERATIONS.

81 cases remained dry or 90 per cent.
6 cases discharged or 10 per cent.

Primary failure of skin graft	1 case
Persistent small perforations of skin graft	18 cases
Late total disintegration of skin graft ..	3 cases (1 case was traumatic).
Tympanoplasty revision required in ..	2 cases
Development of cholesteatoma	0 cases

Note: 1. Preservation of meatal wall periosteum has not been achieved in MOST CASES IN THIS SERIES. PERSISTENT SMALL PERFORATIONS OF GRAFT SHOULD BE REDUCED IF THIS TECHNIQUE IS ADOPTED.
2. 5 of 6 cases that discharged after operation had thickened tympanic mucosa at operation. This finding is an absolute contraindication for myringoplasty.
3. CHOLESTEATOMA HAS NOT DEVELOPED IN ANY CASE IN THIS SERIES.

Table V shows that 90 per cent. of cases have remained dry. Examination of the grafts in the tympanum years after operation shows the presence of small hairs growing on them and proves that they will survive indefinitely provided that the grafts have been applied correctly to a

suitably vascular bed. It is not correct to think that a free skin graft acts only as a scaffold for other cells to grow into.

The free graft can of course die and be cast off. Healing if it occurs will then be by granulation with a lining of scar tissue.

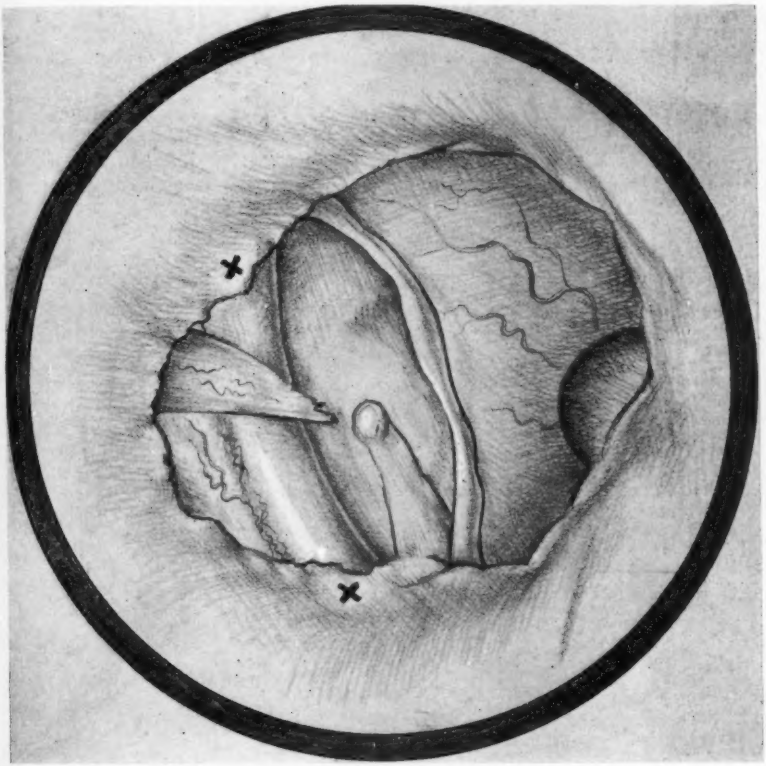


FIG. 4.

Drawing made during a myringoplasty operation showing a view of postero-superior aspect of right tympanum. Bone of posterior meatal wall has been removed as marked by two X. The long process of incus is eroded and the inco-stapedial joint is absent. The ossicular chain is therefore not functioning. The free graft will be applied and put into position in such a way that it not only closes the defect in the tympanic membrane but lies also in contact with the remains of the long process of the incus and head of the stapes. The remains of the tympanic membrane with its perforation are not seen in this drawing as it shows a small area under high magnification.

Table VI shows the incidence of otitis media after myringoplasty. Four cases of otitis media occurred months or years after operation. They were all treated by penicillin and in only one case was the graft destroyed.

TABLE VI.

OTITIS MEDIA AFTER 87 MYRINGOPLASTY OPERATIONS.

Immediate post operative period	1 case
Late otitis media (in 1 case graft was destroyed)	4 cases

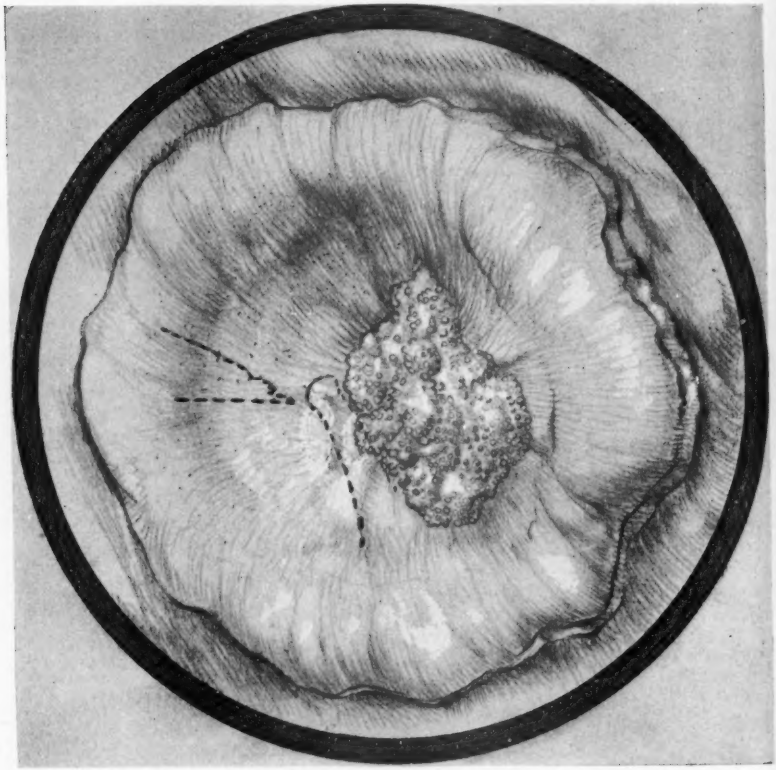


FIG. 5.

The skin graft is now being applied to close the defect of the tympanic membrane and also to lie in contact with the remains of the long process of the incus and the head of the stapes. This technique preserves the lever action of the ossicular chain and gives better hearing than would be obtained by attaching the graft to the head of the stapes only, as has been advocated when this lesion is found at a myringoplasty operation.

Table VII shows the type of perforations dealt with in this series and as would be expected the majority were the result of otitis media. There were three traumatic perforations of the ear-drum one from an explosion of a domestic boiler during a freeze up, one from a blast of compressed air in a factory and one from a perforating foreign body.

TABLE VII.

TYPES OF PERFORATION AND ÆTIOLOGY.

Subtotal and total drum perforations	22
Large central perforations	56
Small central perforations. ..	9

3 Traumatic perforations. Remainder from otitis media.

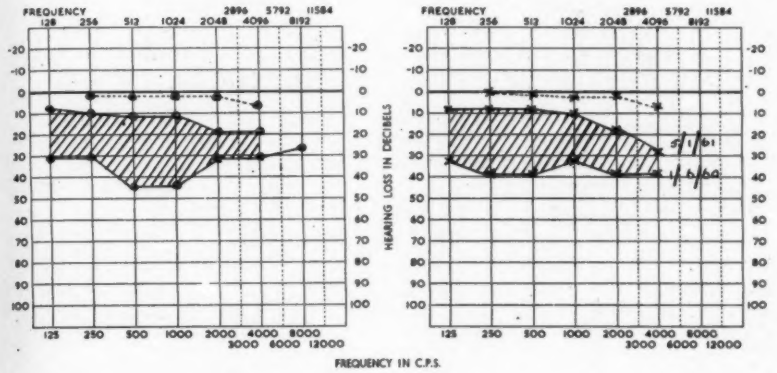


FIG. 6.

HEARING GAIN AFTER BILATERAL MYRINGOPLASTY.

In this patient the ossicular chain was interrupted as part of the long process of the incus was missing. An extended myringoplasty was performed and the graft was placed in contact with the remainder of the long process of the incus and the head of the stapes. A better functional result is achieved with this method as the lever action of the chain is still retained.

TABLE VIII.

SEX AND AGE DISTRIBUTION OF 87 MYRINGOPLASTY OPERATIONS.

Male	40	
Female	47	
Age	5 — 10 years	23 cases
	10 — 20 years	33 cases
	20 — 30 years	10 cases
	30 — 40 years	10 cases
	40 — 50 years	6 cases
	over 50 years	5 cases

Note: PERFORATIONS OF GRAFT APPEARED IN 4 out of 5 patients over the age of 50 yrs.

Table VIII shows that with the present technique the graft does not survive well in patients over the age of 50 years. There might thus be grounds for trying other types of graft in older patients.

In conclusion, my results lead me to believe that myringoplasty is a worthwhile procedure provided that patients are selected most carefully and provided that an operation is performed which combines sound principles both of the plastic surgeon and the otologist.

An examination of my results will show that failures would have been less frequent if more careful selection of cases had been achieved.

Acknowledgements

I would like to thank the Sheffield Regional Hospital Board for a grant towards the cost of the preparation of the drawings by Mr. Alfred Foster the medical artist, whose patience and skill are acknowledged in gratitude.

Mr. Wilfred Hynes, Consultant Plastic Surgeon to the United Sheffield Hospitals has given me much useful advice and information about problems in plastic surgery and I am very grateful to him.

REFERENCES

Beales, P. H. (1957) *J. Laryng.*, **71**, 162.
——— and Hynes, W. (1959) *J. Laryng.*, **73**, 527.
Bocca, E., and Cis, C. (1959) *Arch. Ital. Otol. Suppl.* **40**, 223.
Guilford, F. R., and Wright, W. K. (1958) *Laryngoscope* (*St. Louis*). **68**, 825.
Mawson, S. R. (1958) *J. Laryng.*, **72**, 56.
Thorburn, I. (1960) *J. Laryng.*, **74**, 453.

Rossington Bridge House,
Rossington,
nr. Doncaster

A CLINICAL EVALUATION OF THE USE OF PREMARIN IN THE TREATMENT OF EPISTAXIS

By J. H. GRANT (Liverpool)

JACOBSON (1941, 1945, 1954, 1955), the first to propose the hypothesis that "spontaneous hæmorrhage" was a clinical entity, claimed that this might be precipitated by a hormonal imbalance, particularly an oestrogen deficiency. The discovery of a vascular toxin in states of oestrogen deficiency by Smith & Smith (1946, 1947 a & b) supported this contention. This led to the treatment of cases of "spontaneous hæmorrhage" with oestrogens, but the results published were conflicting (Cooner & Burros, 1960; Andersen, 1960; Koch, Escher & Lewis, 1952).

In view of the above divergent reports and the fact that epistaxis is said to be the commonest manifestation of this clinical entity, it was decided to carry out a clinical trial to assess the place of oestrogen therapy in the treatment of epistaxis. This was completed in 1960.

Materials and Methods

Fifty-seven consecutive cases of epistaxis were divided into two groups on the "toss of a coin" basis.

Group A were given a placebo by intravenous injection.

Group B were given an oestrogen compound "Premarin" intravenously, in a freshly made up solution. The dosage of "Premarin" employed was 10 mg. in children under the age of 12 years and 20 mg. in older children and adults.

In both groups Trotter's method was used routinely.

In all cases the same person estimated the time interval between the intravenous injection and the cessation of bleeding and was unaware of which treatment had been given.

Results

These were examined as follows:—

(i) The proportion which had not stopped bleeding in half an hour.
(ii) The mean bleeding time for those cases with bleeding times of less than half an hour.
(iii) A combined reading where a score of 45 minutes was given to those cases with bleeding times greater than half an hour.

It is sufficient to quote the results for the last mentioned criterion. Table I sets out the means of the combined readings.

When comparing the mean of each different group, it is necessary to allow for the variation which occurs between patients within the groups. The standard deviation of this variation is approximately 16 minutes, from which may be deduced the standard error of the mean of each group. These are shown in Table II.

TABLE I.

MEAN BLEEDING TIMES.

	Treatment A			Treatment B					
Age group	Males	Females	Combined F & M	Males	Females	Combined M & F	All Males	All Females	All Patients
0-59	30·0 (3)	33·3 (6)	32·2 (9)	25·0 (8)	33·0 (5)	28·1 (13)	26·4 (11)	33·2 (11)	29·8 (22)
60–69	36·2 (4)	36·4 (7)	36·3 (11)	31·3 (4)	45·0 (1)	34·0 (5)	33·8 (8)	37·5 (8)	35·6 (16)
70 upwards	28·8 (4)	22·5 (6)	25·0 (10)	25·0 (2)	32·1 (7)	30·5 (9)	27·5 (6)	27·7 (13)	27·6 (19)
Over all age groups	31·8 (11)	31·0 (19)	31·3 (30)	26·8 (14)	33·5 (13)	30·0 (27)	29·0 (25)	32·0 (32)	30·7 (57)

Bleeding times $>\frac{1}{2}$ hour given an arbitrary score of 45 minutes.
Figures in brackets represent the number in the group.

TABLE II.

No of patients in group.	Standard error of the mean.
4	8
8	5·7
12	4·6
16	4·0
20	3·6
30	2·9
n	$16/\sqrt{n}$

The 95 per cent. of error is twice the standard error; it is therefore clear that sex, age or drug do not produce any significant statistical difference. Any conclusions based on the apparent difference between some of the means in Table I must be of a very tentative nature.

Discussion

The results of this clinical investigation clearly show that "Premarin" does not have any significant effect in altering the duration of bleeding in cases of epistaxis. With the exception of a case of a fractured nose and another of acute sinusitis, all patients came within the category of "spontaneous hæmorrhage", as defined by Jacobson (1941). These findings

are supported by similar reports concerning the efficacy of "Premarin" during the course of, and following prostatic surgery (Cooner & Burros, 1960; Andersen, 1960), and the paper by Kudish & Rapaport (1960), in which is noted the failure of this drug to affect plasma clotting factors. One of the few papers dealing with the beneficial effects of intravenous "Premarin" on the blood coagulation factors is that by Johnson (1957) which notes a sharp rise in the plasma Ac-globulin and prothrombin concentration with a small decrease in anti-thrombin plasma activity following oestrogen therapy. In Jacobson's experiments, the animals used were dogs of both sexes and thus these conclusions are to be applied to humans only with caution. Further, the animals used had not been subjected to blood loss.

One patient suffering from multiple hæmorrhagic telangiectases was included in this series and it was found that even repeated intravenous injections of "Premarin" failed to have any beneficial effect upon either the duration or frequency of the epistaxes. It would however be fallacious to draw any conclusions from one case, so that the author is unable to confirm or deny the results obtained by Dolowitz, Rambo & Stephens (1953), who report the failure of oestrogen therapy in this disease, and those of Koch, Escher & Lewis (1952), who are more favourably impressed.

Summary

The failure of the oestrogen compound "Premarin" to have any effect on the duration of epistaxis is reported in this paper.

Acknowledgements

I wish to thank Mr. Martin, Mr. McFarland, Mrs. Abercromby, Mr. Tumarkin, Mr. Siegler and Mr. Pracy for allowing me access to their patients for the purpose of this trial. My thanks are also due to Imperial Chemical Industries Limited for supplying the "Premarin" used in this investigation; to Dr. K. G. Green for his constant help and encouragement, and to Dr. O. L. Davies for undertaking the statistical analysis of the results obtained.

REFERENCES

Andersen, R. (1960) *Nord. Med.*, **63**, 187.

Cooner, W. H. and Burros, H. M. (1960) *J. Urol.*, **83**, 64.

Dolowitz, D. A., Rambo, O. N., Jr., and Stephens, F. E. (1953) *Ann. Otol. (St. Louis)*, **62**, 642.

Jacobson, P. (1941) *Virginia med. Monthly*, **68**, 37.

——— (1945) *Virginia med. Monthly*, **72**, 73.

——— (1954) *A.M.A. Arch. Otolaryng.*, **59**, 523.

——— (1955) *West. J. Surg.*, **63**, 711.

Johnson, J. F. (1957) *Proc. Soc. exp. Biol., (N.Y.)*, **94**, 92.

KOCH, H. J. Jr., ESCHER, G. C., and LEWIS, J. S. (1952) *J. Amer. med. Ass.*, **149**, 1376.
KUDISH, H. G., and RAPAPORT, S. I. (1960) *J. Urol.*, **83**, 730.
SMITH, G. VAN S. (1947) *Amer. J. Obstet. Gynec.*, **54**, 212.
SMITH, O. W. (1947) *Amer. J. Obstet. Gynec.*, **54**, 201.
——— and SMITH, G. VAN S. (1946) *J. clin. Endocr.*, **6**, 483.

Liverpool Ear, Nose and Throat Infirmary,
Myrtle Street,
Liverpool 7

THE HÆMOPHILIAC AS A SURGICAL PROBLEM

By D. F. N. HARRISON (London)

THE hæmophiliac is a constant source of worry both to himself and to his medical advisers. From time to time surgical intervention is necessary and it is essential that the surgeon is aware of the underlying hæmatological defect and the methods which may be employed to minimize the risk of hæmorrhage.

The oto-rhino-laryngologist is not immune from these problems and this brief paper deals with the basic principles of treatment and is illustrated with two recent cases.

In the normal person the blood clots when there is enough thrombin, formed from the circulating prothrombin, to convert plasma fibrinogen to insoluble fibrin. This prothrombin conversion occurs as a result of the interaction between the blood and a tissue factor from outside the blood stream . . . extrinsic conversion, and an intrinsic conversion in which all the required constituents are already present within the blood vessels.

Hence extrinsic conversion occurs when the blood is in contact with injured extravascular tissue and does not require the anti-hæmophilic factor. This process is normal in hæmophiliacs and the blood will clot normally when it is in contact with damaged tissue.

Intrinsic conversion requires the presence of numerous plasma proteins one of which is the anti-hæmophilic factor (AHF), so that in the classical hæmophiliac this conversion is abnormal. This combination of normal extrinsic prothrombin conversion and defective intrinsic conversion found in the classical hæmophiliac produces a typical clinical picture. For some hours after a large tissue laceration there may be little bleeding and the wound is filled with blood clot. This has been formed by extrinsic prothrombin conversion and lies outside the blood vessel. It acts as a weak plug but as soon as the blood pressure rises it is pushed aside and hæmorrhage commences. Adequate conversion of intrinsic prothrombin is essential to form a clot within the blood vessel.

Considerable experience in the handling of the hæmophiliac patient has been gained by the dental surgeons. The rationale described by Wolf (1960) and based on 18 cases of multiple dental extractions is logical and has been used with success.

Ideally the hæmophiliac could be transfused with human antihæmophilic factor before operation, but this is not generally available. Animal antihæmophilic factor is antigenic and thus of limited value.

Fresh blood is useful to replenish severe blood loss but is not particularly effective in arresting hæmorrhage, as its content of AHF is limited by the volume of plasma. The best available material is fresh frozen plasma readily obtainable from the blood banks. This is stored at −25° C. and must be thawed out rapidly, slow thawing leads to protein denaturation and a considerable loss of AHF. The thawed plasma must be transfused quickly or else the AHF is excreted by the kidneys more rapidly than it is being given. 400 ml. of fresh frozen plasma given to a man weighing 12 stone within 30 minutes produced a rise of plasma AHF from 3 per cent. to 8 per cent. of average normal. When given over two hours no rise took place (Wolf).

A severe hæmophiliac is one suffering from spontaneous hæmorrhages. These cases require both pre-and post-operative transfusions of AHF for any surgical procedure. The mild cases, usually bleeding only after trauma, require a pre-operative transfusion of AHF. However it is essential that even the mildest case has this AHF for once hæmorrhage has produced tissue damage then the mildest case will react as acutely as the severe case, and the bleeding will be difficult to stop. This point is well illustrated in CASE I. Transfusions of AHF produce a much smaller rise of plasma AHF in the presence of a hæmatoma or active bleeding . . . hence the clinical effect of such transfusions is greatly lessened.

CASE I.

Keith C., aged 16, was first seen at the Ear, Nose and Throat Department, Guy's Hospital, in October 1959. He complained of severe left-sided frontal headaches and complete obstruction of the left side of his nose. There was a history of trauma to the nose when he was 8 years old and his symptoms had been present ever since. He was a known hæmophiliac having had troublesome bleeding from the gums after dental extractions in the past, there had been no spontaneous bleeding at any time and his last hæmorrhage following injury was in 1951.

He was seen in the Hæmatological Department who reported "normal platelets and accelerated clotting times. The ordinary clotting times were slightly prolonged. Thromboplastin generation was normal with the patient's serum and platelets but defective with the patient's plasma. The patient is undoubtedly a mild hæmophiliac".

Both the patient and his parents were extremely anxious that something should be done about the severe nasal obstruction as it was seriously interfering with schooling and it was decided to carry out a sub-mucous resection.

The boy was admitted to Hospital and on the advice of the Hæmatological Department he was given 1 pint of fresh whole blood before the operation and a further pint during the procedure, the second pint being given slowly.

The operation was quite uneventful and the bleeding minimal. On the following three days the patient was transfused daily with one pint of fresh frozen plasma but no particular care was taken either of speed of thawing nor rate of transfusion. Clotting times carried out immediately after these transfusions showed no variation from the original values and on the fourth post-operative day the nose started to bleed. This bleeding persisted for a week despite daily transfusions of fresh frozen plasma, removal of blood clot, adrenalin packs, etc. Because of blood loss it was necessary to give another pint of fresh whole blood and eventually the nasal bleeding ceased. The patient has been seen on many occasions since and is now symptom free.

CASE II.

Patrick H., aged 48 years, was referred to the Ear, Nose and Throat Department, Guy's Hospital, by his general practitioner in August 1960, because of a persistent chronic maxillary sinusitis. The patient complained of a persistent foul smelling discharge from the left side of his nose for the previous 16 months. X-ray had showed an opaque left maxillary antrum and he had been given a full course of Penicillin and later a broad spectrum antibiotic . . . all without success. The problem was complicated by the fact that the patient was a fairly severe hæmophiliac. This was first diagnosed at the age of 7 years when he bled for two weeks after biting his tongue, and since this time he had many severe hæmorrhages after dental extractions and one spontaneous hæmarthrosis. His doctor felt that some form of sinus surgery might be required and was anxious that this should be carried out at Guy's who had had the pleasure of dealing with the patient's previous dental extractions.

Hæmatological investigation showed a moderate increase of the clotting time and on the day prior to operation he was given one pint of fresh frozen plasma. On this occasion the plasma was thawed rapidly in a thermostatically controlled water bath and then transfused within 30 minutes.

A left antral washout revealed thick mucopus and an intranasal antrostomy was then performed as there appeared to be no immediate indication for more radical surgery.

One further pint of fresh frozen plasma was given the day following the operation and the patient went back to Lincolnshire three days later. He was extremely pleased with both the operative result and the lack of bleeding for like the majority of severe hæmophiliacs he was most apprehensive of any procedure which he felt might produce a hæmorrhage.

No claim is made that the procedures described offer a complete answer to the problem of surgery in the hæmophiliac. Lambert *et al* (1960) describes tonsillectomy in such a case using human AHF as a protection. However in many places this may not be readily available and the dental

surgeons who probably have unrivalled experience of these problems appear to have success with fresh frozen plasma.

Summary

Two cases of minor surgical procedures in known hæmophiliacs are described with a brief discussion on the merits of fresh frozen plasma in such cases.

Acknowledgements

I would like to thank Mr. R. J. Cann and Mr. L. F. W. Salmon for permission to report these cases which were under their care.

REFERENCES

LAMBERT, V., NOUR-ELDIN, F., and WILKINSON, J. F. (1960) *J. Laryng.*, **74**, 431.
WOLF, P. (1960) *Guy's Hosp. Gaz.*, **74**, 279.

"Woodley"
4 Upfield,
Horley, Surrey

CLINICAL RECORDS

A COMPLICATION OF THYROID ADENOMA

By F. C. ROBSON and J. D. K. DAWES (Newcastle-upon-Tyne)

HÆMORRHAGE into a thyroid adenoma is a rare complication but one well enough known. Such an occurrence is usually precipitated by coughing but in this case by shouting.

Otherwise this is a typical case presenting as acute dyspnœa with recurrent laryngeal nerve paralysis.

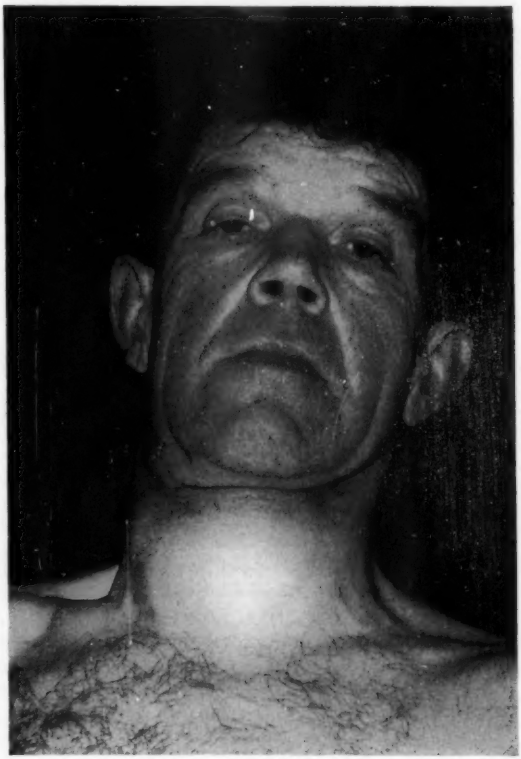


FIG. 1.
Anterior view of neck showing extent of swelling.

Patient W. K. Male, aged 60 years. Occupation: Farm Manager.

This patient had a non-toxic goitre for 35 years. Several years before the present episode the adenoma had increased in size but returned to its former

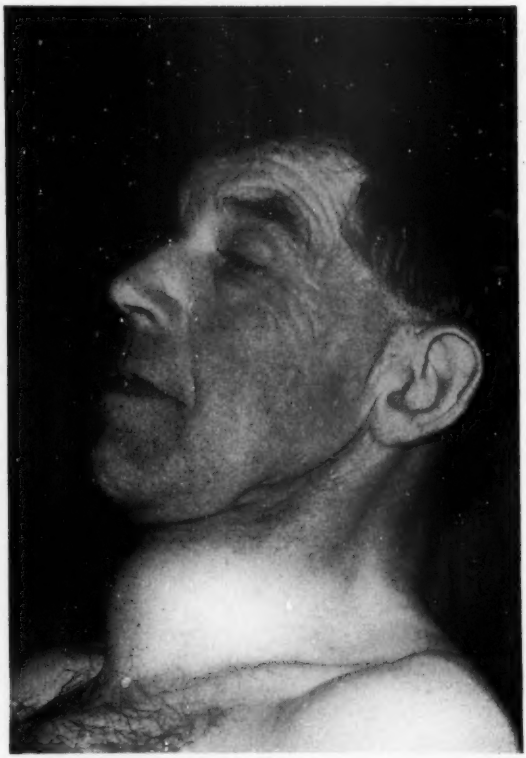


FIG. 2.
Lateral view of neck, taken at the same time as Fig. 1.

state after a course of Lugol's iodine. Three weeks before the patient was seen the adenoma started to enlarge, and he had taken a few spasmodic doses of iodine.

On the day of admission the patient was shouting at his cattle when he suddenly felt his neck become tight. After a quarter-of an hour there was a large tense swelling over the lower part of the neck. One hour later his voice was hoarse. The patient had a cup of tea and a slice of bread and butter, but it was difficult to swallow, so he did not attempt to take anything else by mouth. Two hours later he was unable to cough properly and on attempting to do so thought he would choke.

Past History

Twelve years ago, after having an impacted fish bone removed from the throat, he was told that his trachea deviated to the right.

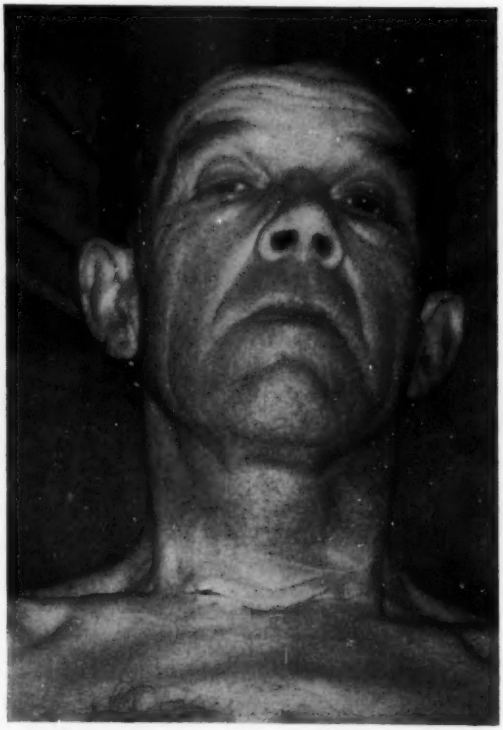


FIG. 3.
Anterior view of neck after operation.

Examination

The patient was dyspnœic and frightened. There was a tense diffuse swelling over the lower part of the neck limited above by the oblique line of the thyroid cartilage, and below extending into the superior mediastinum (Figs. 1, 2). Laterally the swelling extended beneath the sternomastoid muscle on the left side.

Indirect Laryngoscopy

The larynx and trachea were deviated to the right. There was a left recurrent nerve paralysis.

Diagnosis

A diagnosis of hæmorrhage into an adenomatous cyst of the thyroid was made.

Management

The patient was put to bed in Fowler's position with oxygen available. His respirations improved and it was decided to keep him under observation, on penicillin: for exploration the following morning.

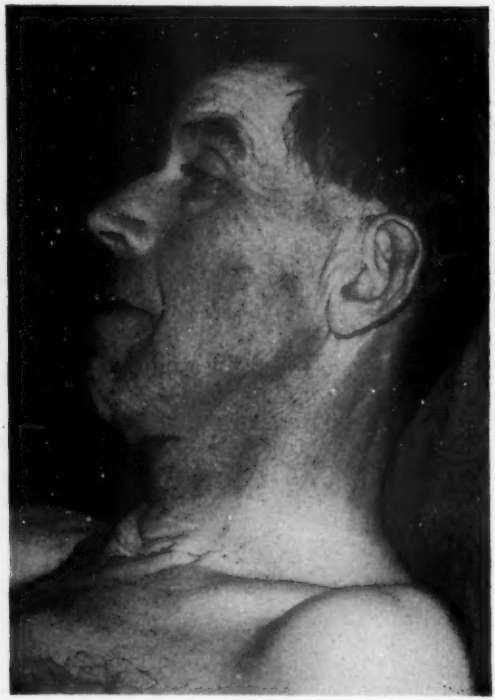


FIG. 4.
Lateral view of neck after operation.

Operation. Exploration of the Neck. (J. D. K. Dawes.)

A collar incision was made over the middle of the mass. The left sterno-hyoid and sterno-thyroid were divided. The mass was a thyroid adenoma into which there had been a large hæmorrhage. The mass extended to the left along the thyroid cartilage laterally to the carotid sheath, and inferiorly into the superior mediastinum to the level of the aortic arch. It was possible to separate

it from the overlying structures and remove the adenoma. Another calcified adenoma occupying the isthmus of the thyroid gland was also removed. A corrugated drain was placed in the left superior mediastinum and the wound closed.

The patient made an uneventful recovery and was discharged seven days later (Figs. 3 & 4). The recurrent laryngeal nerve paralysis was permanent in

FIG. 5.

Large cyst into which hæmorrhage had occurred, with smaller calcified cyst which was removed at the same time.

this instance. If surgery had been earlier it is possible that the recurrent laryngeal nerve paralysis might have recovered.

Pathology (Fig. 5)

The specimen consisted of (1) a smooth walled ovoid tumour 12 cms. in length weighing 400 gms. On section it consisted of 2 thyroid cysts containing a mass of recent blood clot; (2) a small fragment of thyroid tissue containing calcium.

Histology

Both portions showed an adenomatous goitre with retrogressive changes and recent hæmorrhage into a cyst.

Royal Victoria Infirmary,
Newcastle-upon-Tyne

PRELIMINARY COMMUNICATION: MYRINGOPLASTY PERFORMED WITH A PERITONEUM HOMOGRAFT

By D. A. BIRCH (London)

IN THE past decade various types of grafts have been used in middle-ear surgery. The advent of tympanoplasty procedures encouraged the use of Thiersch and full-thickness tympanoplasty autografts. Recent developments in stapes surgery for otosclerosis have included mobilization of the stapes and interposition of various types of autografts between the footplate and the fenestra vestibuli. Tissues chosen for this work have included buccal mucosa, conjunctiva, vein wall and fat, but they have not been generally accepted. Search has continued for a tissue which will resist infection, have a sufficient tensile strength and yet be thin enough to conduct sound. The idea of using peritoneum as a homograft for this type of procedure was suggested by the work of Shackman, who demonstrated that peritoneum could be transplanted from one rat's peritoneal cavity to another's, and the graft was accepted by the host without any antigenic reaction. He carried out extensive experiments and showed that the donor area of peritoneum survived in the host, becoming later indistinguishable from the host's own peritoneum.

Case Report

A female patient of 12 years old with a sub-total perforation of the right tympanic membrane was admitted for a myringoplasty. The perforation had been dry for one year. At operation the outer surface of the tympanic membrane remnant and the adjacent area of the skin of the external auditory meatus was scarified with a needle. The homograft of peritoneum was obtained from a hernial sac of another male patient and was prepared for the operation by storing in a sterile penicillin solution and kept in the refrigerator at 4° C. for one week before use. At the time of operation this graft was cut to a suitable size and the serosal surface was placed on the raw area of the tympanic membrane and the external canal. The outer surface of the graft was covered with black nylon net to make it more manageable, and the external canal was packed with cotton wool dressings. These dressings were left undisturbed for 14 days and were then removed with the black nylon net under a general anæsthetic. At the time of the second operation the graft appeared to have taken completely. A redundant section of the graft was removed for biopsy and at this time some considerable bleeding occurred, which supported the clinical impression that the graft had taken. The histological report of this biopsy was as follows:—

"The excised piece of peritoneum showed slight mucoid degenerative change as well as slight proliferation of fibroblasts and a few inflammatory cells, but the evidence in the sections is still viable tissue."

Subsequent audiological findings showed that the hearing had improved by

10 decibels, raising the threshold to a hearing loss of 10 decibels. The graft showed no evidence of subsequent sloughing.

Comments

A myringoplasty was purposely chosen for this procedure because of the experimental nature of using the peritoneal graft in the middle ear. It is intended however, from the experience of this case, that some work will be done with peritoneum in other plastic procedures involving the middle-ear structures. It is felt, however, that subsequent work will be facilitated by using peritoneum from laparotomies rather than from hernial sacs, because the peritoneum of the hernial sac is thicker and rougher than that of the abdominal cavity.

Acknowledgements

I am indebted to Mr. Henry Sharp for allowing me to operate on this patient and to Dr. Martin Bodian for the histological report on the biopsy. I am also grateful to Mr. Ralph Shackman for his help and criticism.

REFERENCE

SHACKMAN, R. (1960), Personal Communication.

Guy's Hospital,
London, S.E.1

FOUR RECENT CASES OF JUVENILE FIBROANGIOMA OF THE POSTNASAL SPACE

By F. C. W. CAPPS, G. IRVINE, R.N., and P. TIMMIS (London)

FIBROANGIOMA is a comparatively rare tumour although it is the most common of the benign tumours of the postnasal space. The incidence varies in different countries. In New York, Allan in 1934 reported an incidence of 1:16,000 other cases with E.N.T. disease, in Mexico Tapia found 70 cases of this tumour in 6 years and in Finland Harma found an incidence of 1:6,000.

Pathogenesis:

This tumour is not a true neoplasm as there is a tendency to spontaneous regression. It is confined to one sex, one age group and one site. Fibroangioma is probably caused by a hormonal factor active at puberty and of fairly short duration.

It is accepted that it arises from the periosteum or perichondrium of the basiocciput or basisphenoid, ethmoids or vomer as a result of irregular development of the skull base during puberty. Ossification of the basisphenoid takes place at about the 25th year.

Age and Sex:

The average age of onset of the first symptoms is 15 years. In the series of 52 patients with this tumour described by Härmä, in the youngest case the symptoms first appeared at the age of 11 years, in the oldest at 25 years.

It has been established that nasopharyngeal angiofibroma does not occur in females. The few cases reported in females have invariably turned out to be a pedunculated fibroma or polyp on histological examination.

Symptoms:

These are due to the mass of tissue, the spread of the tumour and the vascularity.

The mass produces primarily nasal obstruction, rhinolalia clausa, nasal infection with discharge and the signs and symptoms of Eustachian obstruction. Vascularity produces the most common presenting symptom, recurrent severe epistaxis with secondary anæmia. The spread produces deformity of the face as it extends into the nose, ethmoids and maxilla (frog face), interference with movements of the palate and cranial nerve lesions.

Differential Diagnosis:

Choanal polypi are pale soft structures on a long pedicle. Other tumours, such as sarcoma and carcinoma, are very often associated with involvement of cervical

glands; dermoid and mucus cysts occur in the nasopharynx, and a biopsy will settle the diagnosis.

Soft tissue radiological views produce a uniform shadow in the nasopharynx and show the extension of the angiofibroma into the nose and base of skull.

Carotid arteriograms usually show increased diameter of the corresponding internal maxillary artery and illustrate the vascular network of the tumour supplied by the enlarged vessels.

Treatment:

There are three methods, which can be combined.

Hormonal:

Hayes Martin has described hormone therapy combined with minor surgery, holding that spontaneous regression occurs when sexual maturity has been reached.

Radiotherapy:

Radium needles, radon seeds or deep x-ray reduces the vascularity of the tumour and so its size. This treatment may be the one of choice if surgery is contra-indicated.

Surgery:

This is the treatment of choice with complete extirpation of the tumour and its extensions. The approach used in this series is that described by Wilson, the transpalatal fenestration.

Histology:

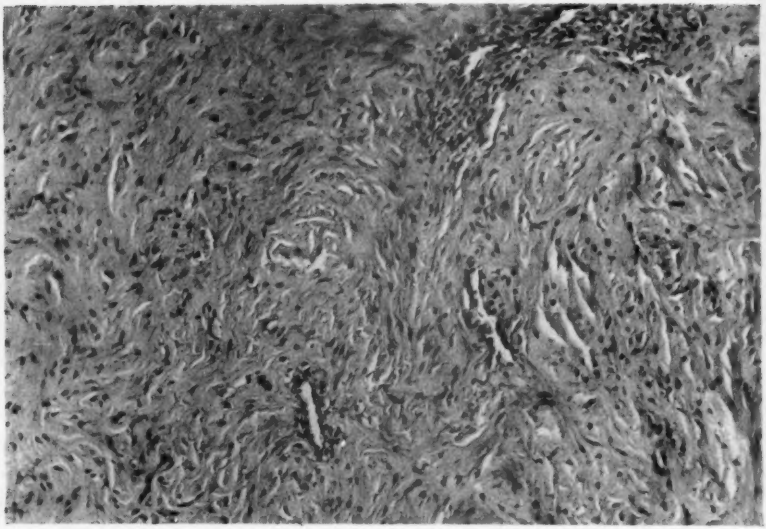
The main components are numerous blood vessels both of large calibre and capillary size, made up of unevenly distributed hyperplastic endothelium and of a large amount of stroma rich in collagen and containing fibroblasts.

There are two main types of angiofibromas, the non-recurrent and the recurrent types, and it is the vascular structure of the tumour which indicates the type. The total area of blood vessels is greater in the non-recurrent type, the vessels being of large calibre with few proliferative changes in the vessel wall. Where the number of vessels is great, with numerous proliferative small vessels and occasional obliteration of the lumen, there is marked liability for rapid growth and recurrence after treatment.

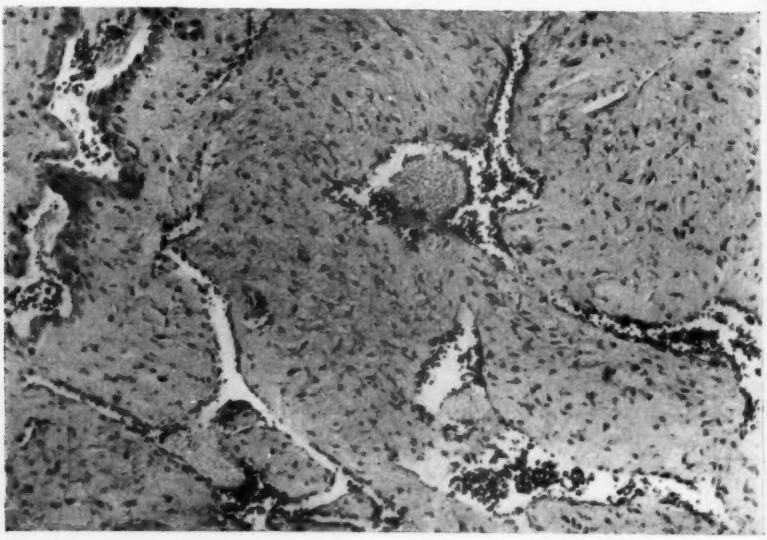
Four cases are now described:

1. *T.F. aged 16.*

This boy who was a Junior Seaman in the Royal Navy began to have attacks of epistaxis some eighteen months prior to being seen at St. Bartholomew's Hospital, and approximately one year before going into the Royal Navy. Some of the attacks were very severe necessitating admission to a naval hospital on three occasions for transfusions and packing of the right nasal passage. Little's area was cauterized on two occasions with little result and 5 months after joining the Navy the right nasal airway became completely blocked. He was



CASE 1. T.F.
Densely fibrous tumour with scanty vascular channels showing little endothelial proliferation.



CASE 2. K.H.
Similar fibrous tissue but with larger cavernous blood spaces.

transferred to Haslar Hospital and was examined under an anæsthetic and a large polyp was reported to be seen arising from beneath the middle turbinate. On seizing this with a pair of Tilley-Henckel forceps torrential hæmorrhage occurred and the operation was abandoned.

Examination revealed a smooth red mass occluding the right choana.

On *April 30th, 1959*, removal was carried out by the transpalatal fenestration approach using a periosteal elevator to separate the tumour from its attachment to the vault of the nasopharynx and the margin of the right choana. The cavity was packed with B.I.P.P. and the edge of the divided palate sutured. A temporary fistula of the palate occurred but it closed within 1 month.

2. *K.H. aged 19.*

This young man was also in the Royal Navy as an Electrical Mechanic.

His history was of recurrent severe nose-bleeds lasting up to two hours for 18 months. He had his nose cauterized on three separate occasions by different consultants and on two occasions they had reported no abnormality in the postnasal space. He had even had his tonsils removed 10 weeks before admission to the Royal Naval Hospital, Haslar. For three months he had had complete left nasal obstruction.

Examination revealed a smooth blue-red swelling obstructing the left choana. He was then transferred to St. Bartholomew's Hospital and examination under an anæsthetic showed the attachment of the tumour to the roof of the nasopharynx and the lateral wall of the left choana. A soft tissue x-ray of the P.N.S. was taken (Fig. 1.).

Arteriograms showed an enlarged left internal maxillary artery with the vascular supply from this artery to the tumour (Fig. 2).

Removal was carried out transpalatally on *August 27th, 1959*. A fistula again developed in this case and a small one still persists. He has remained free from trouble since.

3. *J.H. aged 14.*

This boy had a 2 year history of left nasal obstruction which had affected his voice and a 9 month's history of severe attacks of epistaxis.

Examination revealed a large smooth polypoidal mass in the left choana, being visible through the anterior nares. Under an anæsthetic the tumour was found to be firm and fibrous and a biopsy confirmed an angiofibroma.

Carotid arteriograms showed a slightly enlarged left internal maxillary artery. (Fig. 3.)

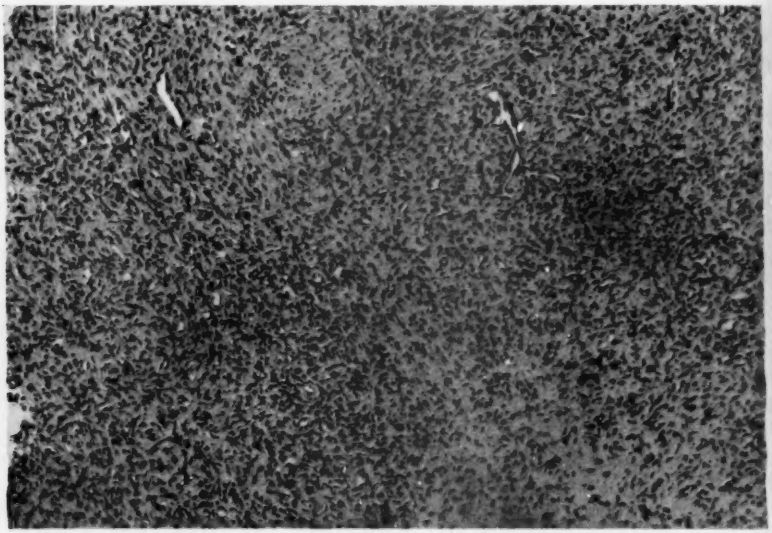
Removal was carried out transpalatally on *March 24th, 1960*. A temporary fistula of the palate lasted 10 weeks. He has remained well since.

4. *R.H. aged 15.*

He complained of a slightly blocked nose for 1-2 years, complete for the last 6 months, during which repeated severe nose-bleeds have occurred, one being whilst at a Boys' Brigade Camp which necessitated being rushed to hospital. It was packed with wool, some of which was not removed until several months later by his own doctor and by then the nasal passages were very infected.

Examination showed a large granular mass covered with mucopus on the left side of the postnasal space and extending into the left nasal passage. Under general anæsthetic a biopsy confirmed an angiofibroma. A soft tissue film of the P.N.S. was taken (Fig. 4).

Carotid arteriogram showed an enlarged left internal maxillary artery supplying the tumour.



Case 4. R.H.

Highly cellular angiomatous tissue with small capillary channels and marked endothelial proliferation.

Transpalatal removal was done on *February 16th, 1961*. The suturing of the palate was carried out in two layers, insertion of most of the sutures being carried out before removing the tumour. This time primary union occurred.

Discussion:

Four cases of fibroangioma have been described occurring in young males referred to the Ear, Nose and Throat Department of St. Bartholomew's Hospital. Two cases were referred by the Royal Naval Medical Service. These two ratings curiously came from the same establishment in the Royal Navy and within 6 months of each other. The two other cases came from hospitals in the Home Counties.

This rare condition is seldom seen in this country, but is more common in the Americas, Finland and Mexico.

The diagnosis is made on the history, age and sex of the patient and the findings of a vascular mass in the postnasal space. There is no involvement

of cervical glands as in malignant tumours and the excessive vascular network can be seen in arteriogram. A biopsy will confirm the diagnosis.

There are two main types, those which tend to recur and those which do not recur. The former are characterized by a short history and histological examination shows numerous small vessels with proliferative changes in the vessel walls. The non-recurring types have a long history of symptoms with large vessels

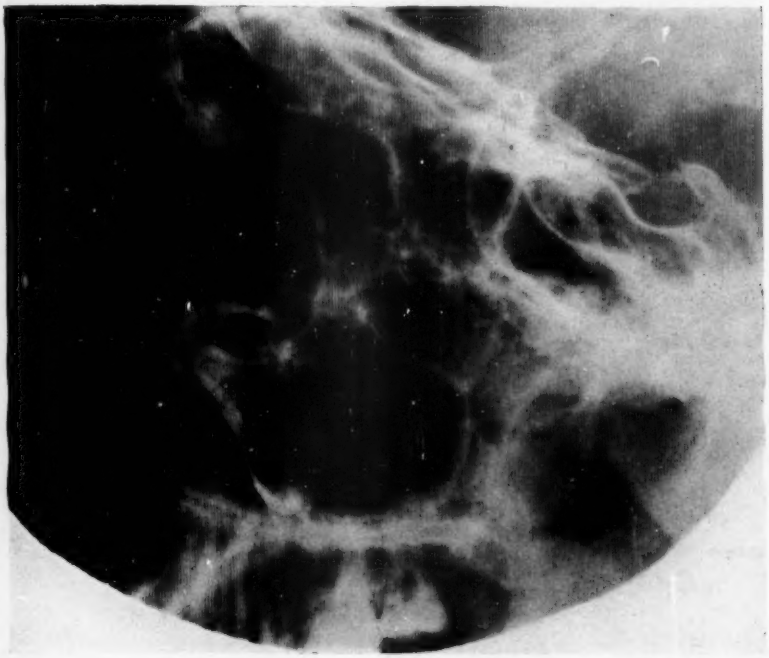


FIG. 1.

K.H. Soft tissue film of P.N.S. showing large tumour.

with few if any proliferative changes in the walls. The total area of blood vessels is greater in this type.

Treatment:

The ideal is total surgical excision and the approach *viâ* the transpalatal route gives adequate access to the area.

Other treatments are:

1. Hormonal method advocated by Hayes Martin combined with minor surgery and irradiation.
2. Radiotherapy where surgery is contra-indicated.

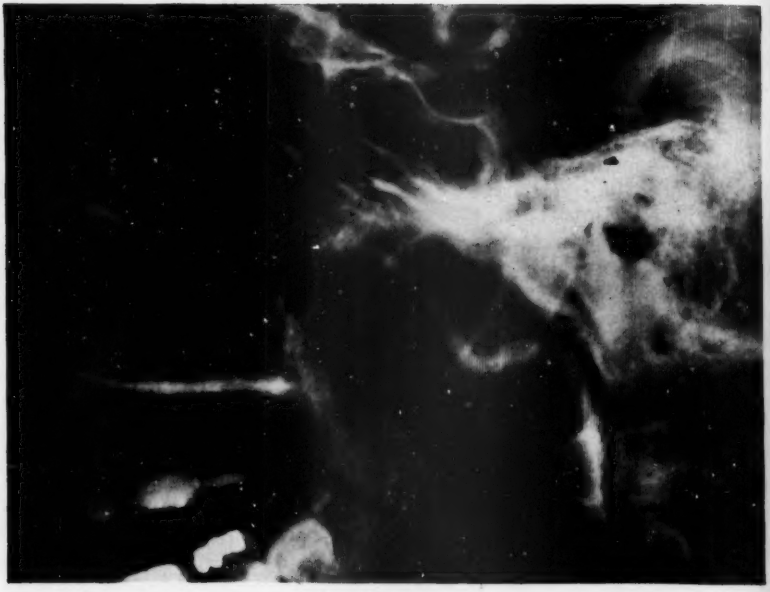


FIG. 2.
Arteriogram showing an enlarged left internal maxillary artery.

FIG. 3.
J.H. Carotid arteriogram showing enlarged left internal maxillary artery.

3. Electrocoagulation as advised by Figi.

Follow up of cases should be carried out for at least two years after removal so that any recurrence can be treated.

FIG. 4.
A soft tissue of the P.N.S. showing a large tumour.

REFERENCES

FIGI, F. A. (1940) *J. Amer. med. Ass.*, **115,** 665.
HÄRMÄ, R. A. (1958), *Acta oto-laryng. (Stockh.), Suppl.* **146.**
HUBBARD, E. M. (1958), *A.M.A. Arch. Path.*, **65**, 192.
MARTIN, H., EHRLICH, H. E. and ABELS, J. C. (1948) *Ann. Surg.*, **127**, 513.
ROUX, D. J. (1958) *S. Afr. med.*, **32**, 219.
WILSON, C. P. (1957) *J. Laryng.*, **71**, 616.

16 Park Square East,
Regent's Park,
London, N.W.1

BENIGN LYMPHOID PSEUDOTUMOUR OF THE PHARYNX

By JAMES E. CRESTON* (Washington D.C.)

BENIGN lymphoid pseudotumour of the pharynx, also known as benign lymphoma, simple lymphoma, lymphadenoma, and benign lymphoid hyperplasia, may offer a diagnostic challenge to the clinician. The pathogenesis of this condition has not been determined. Because of its similar clinical behaviour, it may be diagnosed erroneously as malignant lymphoma.

The occurrence of benign lymphomatous growths in areas of the body other than in the pharynx is well substantiated. The most common sites are in the gastro-intestinal tract, particularly in the appendix, the distal colon, and the rectum (Miller, 1948; Smith, 1943; Li, 1948). In 1952 Hayes and Burr reviewed 228 cases of benign lymphoma of the rectum. These tumours have also been reported in the orbit (Bedell, 1922), as well as in the parotid gland (Škorpil, 1942). Benign lymphoid growths arising from the faucial tonsils are infrequent but cases have been reported. Starry in 1939 found only two such growths, although he microscopically examined 8,516 pairs of tonsils. In 1927 Pearlman and Pilot gave pathological reports of four cases of discrete lymphoid tumours arising from the tonsillar crypts. They were of the opinion that the growths represented an unusual formation of hyperplastic lymphoid tissue rather than true new growths of the tonsil. Chisolm (1939), Docal (1943), Reeves (1945), Bell (1949), and New (1931), described similar tonsillar growths.

It is often difficult to determine whether these hyperplastic lymphoid growths are of neoplastic or inflammatory origin. Eggston and Wolff (1947), believed these structures to be secondary to chronic infection. Although the growths are considered benign, instances of lymphosarcomatous changes have been noted. Ewing (1940), for instance, observed one case of lymphadenoma which had persisted for 18 years and which eventually, with rapid local growth, proved fatal. Subsequent histological examination revealed malignant lymphadenoma.

Upon histologic section, these structures show an intense infiltration with small lymphocytes which are sometimes circumscribed and at other times more of an infiltrative nature. The occurrence of considerable collagenous fibrous tissue stroma is often a striking histologic feature. This type of lesion may or may not be accompanied by germinal centre or follicle formation. If the lesion is of a true neoplastic nature, germinal centres are rarely found.

The following case report is of particular interest, since symptoms relating to the right nasopharynx occurred with the simultaneous appearance of right supraclavicular lymphadenopathy.

* Otolaryngology Service, Department of Surgery, Walter Reed General Hospital, Walter Reed Army Medical Center, Washington 12, D.C.

Clinical Records

Case Report

A 57-year-old Caucasian woman was first seen in *March* of *1960*. Her chief complaints were pain in the right ear, which had existed for one month, and right supraclavicular lymphadenopathy. She was hospitalized for further evaluation and treatment. Upon examination, a distinct lobulated 2 by 2 cm. mass was found in the right nasopharynx which involved the fossa of Rosenmuller. The

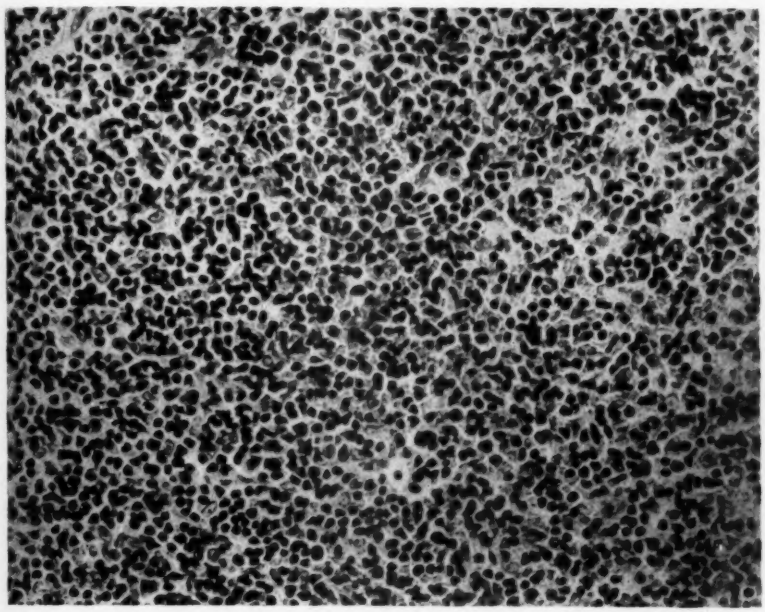


FIG. 1.
Tissue from nasopharyngeal mass × 240.

right tympanic membrane was retracted and failed to respond to either the Valsalva manœuver or to Politzeration. Two firm, non-tender, lymph nodes, each measuring approximately 1 by 2 cm. were palpated in the right supraclavicular area. No other physical abnormalities were present. Laboratory determinations were all normal.

A biopsy of the nasopharyngeal mass and an excisional biopsy of the right supraclavicular nodes were carried out. The pathology report on the tissue from the nasopharyngeal mass and the supraclavicular nodes was atypical lymphoid and reticulo-endothelial hyperplasia with overall preservation of the architecture (Fig. 1). The process was interpreted by the pathologists as being hyperplastic and reactive and not neoplastic.

Following this report, the nasopharyngeal mass was removed under general anæsthesia, and the report on the tissue was identical with the earlier pathology

report. At the time of surgery, the mass completely occluded the pharyngeal orifice of the Eustachian tube. The patient did well post-operatively, and upon subsequent examination, the right tympanic membrane was no longer retracted and moved readily with the Valsalva manœuver. The initial complaint of otalgia was no longer present. At the time of discharge, appointments were made for follow-up examinations.

Summary and Conclusions

1. A case of benign lymphoid pseudotumour of the nasopharynx associated with supraclavicular lymphadenopathy, which simulated a malignancy, has been reported.

2. Although these lesions may appear to be on an inflammatory basis, the malignant tumours which occur in this area must be given serious consideration.

3. Periodic examinations are essential in order to assess the results of treatment as well as to detect sarcomatous changes, should these occur.

BIBLIOGRAPHY

BEDELL, A. J. (1922) *Amer. J. Ophthal.*, **5**, 526.
BELL, D. W. and DRUMMOND, W. A. D. (1949) *J. roy. Army med. Cps*, **92**, 164.
CHISOLM, J. J. (1939) *Arch. Otolaryng.* (*Chicago*), **30**, 986.
EGGSTON, A. A., and WOLFF, D. (1947) Histopathology of the Ear, Nose and Throat, Baltimore. p. 975.
EWING, J. (1940) Neoplastic Diseases, a Treatise on Tumors. 4th edition, Philadelphia. p. 389.
HAYES, H. T. and BURR, H. B. (1952) *Amer. J. Surg.*, **84**, 545.
LI, I. Y. (1948) *Surgery*, **23**, 814.
MILLER, D. (1948) *Amer. J. Surg.*, **76**, 769.
NEW, G. B. and CHILDREY, J. H. (1931) *Arch. Otolaryng.* (*Chicago*), **14**, 596.
PEARLMAN, S. J., and PILOT, I. (1927) *Arch. Otolaryng.* (*Chicago*), **5**, 143.
REEVES, B. (1945) *J. Laryng.*, **60**, 81.
RODRIGUEZ DOCAL, J. (1943) *Rev. méd. cubana*, **54**, 492.
ŠKORPIL, F. (1942) *Frankfurt. Z. Path.*, **56**, 514.
SMITH, T. E. (1943) *J. amer. med. Ass.*, **121**, 495.
STARRY, A. C. (1939) *Ann. Otol.* (*St. Louis*), **48**, 346.

Walter Reed Army Hospital,
Walter Reed Army Medical Center,
Washington 12, D.C.,
U.S.A.

A CASE OF SURGICAL OCCLUSION OF MASTOID AND ATTIC BY FASCIAL GRAFT: REMOVAL AFTER FOURTEEN YEARS

By W. STIRK ADAMS (Birmingham)

IN THE recent discussions in the R.S.M. Section of Otology, in *February 1961*, I referred to the post-operative discomforts in patients who had a complete obliteration of the cortical mastoid. One of these cases, found during a recent survey of functional epitympanomastoid operations performed personally during the past five years (VII International Congress of O.R.L. Paris 1961), is presented here.

Although in this case the patient had a continuing post-operative aural infection, and the cases of fascial obliteration on which my observations were based were usually uninfected after the plastic occlusion, their history of post-operative discomforts was very similar though in the non-infective group the discomfort appeared at an earlier period.

The case presented also suffered the additional disadvantage from the plastic operation, of increased hearing loss with a persistent tinnitus, which continued until the plastic inlay was removed.

Case History

The patient was 20 years of age when she developed a left aural discharge following a head cold, and this continued in spite of treatment for 2 years. She was then referred to my colleague Mr. R. S. Strang on *March 18th, 1942.* in the General Hospital, Birmingham, when she gave a history of a continuous daily brown stained discharge from the ear over the whole period. There was no complaint of tinnitus or of deafness. After wax removal the left drum-head was thickened and reddened, but intact.

A fortnight later a furuncle developed in this external auditory canal, followed by a diffuse otitis externa. Shadowing of the mastoid by X-ray was present, and operation was advised.

She was admitted to the Queen Elizabeth Hospital for this on *June 28th, 1942* but as there was an active psoriasis in her scalp, operation was postponed. Examination then showed a normal right ear, with hearing for a wp.v. at 20 feet distance. On the left side her hearing for the wp.v. was reduced to 4 feet.

Operation

In the following *November* she was readmitted, and a left mastoid operation was performed by Mr. E. M. Woodman on *December 1st, 1942*, with insertion of a fascial graft. The post-aural approach was used, and a periosteal flap fashioned with its base above. The antrum lay deep and far forward in a secondary sclerotic mastoid. The tegnum dura and lateral sinus were exposed and were

normal and healthy. The incus was removed, the cavity dusted with Prontosil powder, and the periosteal flap turned down and inserted into the cavity. The wound was then closed without drainage.

Progress

Her post-operative progress was normal and the ear was dry when she was discharged from hospital 11 days later. A month afterwards however, there was slight discharge and she complained of tinnitus in the ear. Three months later the ear was still discharging. The notes do not mention cholesteatoma pathology nor the post-operative hearing level.

Fourteen years later on *November 13th, 1956* she was referred by her medical adviser Dr. L. K. Thompson of Handsworth, Birmingham, as she had been suffering from pains in her head and around her ears for some months.

She then told me that after the operation in *1942* her left ear had been very much better, though periodically a discharge had occurred with foul odour, the last occasion being some 6 weeks earlier. Deafness and a "singing" tinnitus however, had persisted ever since the operation and for the past few months she had noted a throbbing in her head, an occasional stabbing pain in her right ear, and also in the left ear and in the anterior vertex. She described a "heavy headed" sensation which had been present for a few months, and she felt her head was in a vice and throbbing.

On examination the right drum-head was normal and mobile on −1 mm. Hg. In the left external canal there was debris with a butyricus odour, and an attic perforation was present. She was unable to hear a wp.v. on this side, but heard a conversational voice at six inches distance.

X-ray studies of her accessory nasal sinuses and mastoids were reported by Dr. Hutton:

1. There is a small polypus in the floor of the right antrum. The sinuses are otherwise clear.
2. Surgical defect shown on the left side, with sclerosis of remaining portion of the mastoid. The right side appears normal.

The Revision operation

In view of the increase in local symptoms and the presence of continued sepsis, a revision operation was performed on the left mastoid on *December 28th, 1956*, through a post-aural approach. After the fascial inlay which filled the mastoid cavity superficially was removed, the tegnum dura was found to have descended into the upper part of the cavity. The lateral sinus was not exposed. In the region of the mastoid antrum there was black seropus and a cholesteatoma membrane lined its walls. The facial crest was reduced, the bridge was identified and removed, together with a mass of fibrous tissue in this region. The remains of the malleus were removed from the M.T. and an anterior canal exostosis was also excised. The mastoid tip was exenterated, the cells of the petrous angle opened and the epithelial lining membrane in the attic and mastoid was preserved. The cavity was then filled with a bismuth subnitrate and glycerin pack, after a meatus plastic.

Her immediate progress after operation was satisfactory, and an epithelial dust skin graft was applied to the cavity a fortnight later. She was discharged from hospital 15 days after operation to attend for post-operative dressings.

Post-Operative Progress

A month later her hearing had improved to a wp.v. at four inches distance, but the mastoid cavity continued to discharge, though without odour, and in succeeding months the cavity proved unusually troublesome. A course of superficial X-ray (300 r) was given, but granulations continued to form and required surgical removal in *August 1957*. Later it appeared that Chloramphenicol as a topical dressing was probably responsible for the prolonged irritation of the cavity.

Two months later the cavity had improved and hearing for a wp.v. was at 15 inches distance, and on review on *October 23rd, 1957*, 10 months after operation the cavity was dry and satisfactory, though hearing for a wp.v. had fallen to 4 inches distance. On review in *February 1958*, the cavity was very satisfactory and hearing for the wp.v. had improved to 2 feet distance.

Present Condition

In a recent review, 4½ years after operation, she reported that the ear had remained dry without any attention during the past 3 years. After the operation of *1956* the preceding symptoms of discomfort in her head and ears had completely disappeared, and the only local symptoms now are an occasional stabbing pain in both ears for a short while.

The cavity of the attico-mastoid is lined by a thin white epithelium which is continuous with the upper drum-head, though over the oval window region there is a "V" opening in the membrane. The middle ear is quite dry and hearing for the wp.v. after eustachian catheterization was at 4 feet distance.

Histology

Frozen sections of the membrane from the mastoid antrum and attic (1) and also from the cholesteatoma membrane (2) were examined by Dr. B. T. Davis in the Department of Pathology, the University of Birmingham. He reported on *March 15th, 1957*:

"Both specimens showed scanty isotropic fat droplets only, which were more numerous in (1) than in (2). The droplets were in granulation tissue beneath well formed stratified squamous epithelium."

The frozen technique was in use at this period, as Dr. Davis was carrying out an investigation on the infected membrane in cases of chronic mastoid disease to discover whether cholesterol was present in the clefts described as "cholesterol clefts".

Comment

It would seem probable that the original pathological condition was a black cholesteatosis of the attic, in view of the history of brown stained discharge for two years before the plastic operation. After this, the clinical improvement was

maintained until this pathological membrane again became active and invaded the potential tissue space between the graft and the floor of the mastoid antrum.

The symptoms of local discomfort in the head and ears for which she was referred to hospital in *1956* are in my experience quite unusual in cases of unoperated black cholesteatosis, and it would seem justifiable to conclude that they resulted from a physiological disturbance in function from the presence of the graft. These symptoms disappeared after its removal, and her hearing returned to its level before the plastic operation.

Acknowledgements

I would like to express my appreciation and thanks to my colleagues who have assisted in the preparation of this report: to Mr. R. S. Strang, for making the early records available, to Dr. L. K. Thompson who referred the patient, and to Dr. J. F. K. Hutton and Dr. B. T. Davis for the X-ray and histological studies.

81 Harborne Road,
Edgbaston,
Birmingham, 15

SOCIETIES' PROCEEDINGS

ROYAL SOCIETY OF MEDICINE—SECTION OF OTOLOGY

President: J. P. MONKHOUSE, F.R.C.S.

Discussion on Problems of Tympanoplasty

February 3rd, 1961

The opening papers will be found on pp. 879-908.

H. ZALIN: The use of free skin grafts derived from the external auditory meatus as described by Dr. Plester involves a denudation of the bony wall of the meatus. Theoretically this should involve slow healing by granulations and present a considerable change of stenosis. I would ask Dr. Plester whether in fact this does occur, and if not, why not?

The surgery of the suppurating middle ear and mastoid is our main problem and I am interested in Dr. Plester's approach to this. In particular his description of an indwelling drainage tube introduced through an antrostomy opening through which infected secretions accumulating in the middle ear are aspirated, thus protecting the skin grafts from tension. Assuming that this is possible, and the maintenance of a patent tube over a considerable period in the depths of the antrum presents practical difficulties which may be insuperable. I do not see how the basic objection of the operation is resolved. The suppurating process within the middle ear cannot be expected to subside merely because we have covered it over by skin. We must beware of being mesmerized by our skill in introducing skin into the ear at the expense of basic principles.

Mr. Thorburn is to be congratulated on his exposition of Rambo's temporal muscle graft technique. In this context I would point out that Rambo's work represents a revulsion from the Wullstein conception of tympanoplasty and substitutes a standard technique for eradication of injection and restoration of hearing by fenestration.

I would suggest that the multiple procedures, with their offshoots and modifications, which are now being published at regular intervals, indicate dissatisfaction with the results of Wullstein tympanoplasty and that this dissatisfaction may increase further with time.

MR. FRANCIS MCGUCKIN: The chief reason for today's discussion is surely that, having looked at eight or nine years of tympanoplasty, we find it necessary to modify our thinking about reconstructive tympanic surgery. It is known to some among this present audience that I have come to dislike the use of extra-meatal free-skin, except possibly in the region of the mesotympanum. Even here there may be other ways of getting round the problem, but I must confess

to a limited experience of operating on lesions which are not active. Mr. Beales is right to insist on the most meticulous standards of temporal bone surgery—we have no disagreement here. I am less sure about what is meant by the basic principles of plastic surgery. These are not absolutes and are just as subject to modifications demanded by experience as the original principles of tympanoplasty. Whatever the rules of plastic surgery may say, we must recognize that the skin of the deep canal is unique, being for the most part at once skin and periosteum and not epidermis and dermis, something designed for its own habitat, with its own physiology, its own very slow reproductive capacity and its own temperature environment. I agree that in clean cases with limited damage, extrameatal free skin, which is physiologically alien, may be successful when applied to an area having a first-class nutrition, for example the mesotympanum. Yet I would suggest that the physical and functional results are far better when this free skin is thrown out in the washing after acting as a scaffold for regeneration of mucosa, since in this event the patient is left with the same kind of result as nature produces in cases of spontaneous arrest of disease. Moreover, the successful repair of defects depends upon the mucosal element of membrane, a thing of paramount importance.

It seems to me, Mr. President, that Dr. Plester in his advocacy of the use of meatal skin, Mr. Thorburn in his ingenious application of Rambo's principle, and Mr. Beales in his very restricted use of free skin and also in his much wider use of post-aural pedicle flaps, are all three saying that the original ideas we accepted so readily are in need of modification. At the present time I know of seven different techniques designed to avoid the use of extrameatal free skin, in centres which are as widely spread as Western California and Dusseldorf. Currently I am trying to depend on natural regeneration supplemented by nylon sheets. However, it is only by the free exchange of experience and ideas such as those so ably presented this morning that we can hope to make advances.

Finally, Sir, I would make two points:—

(1) Reconstruction is theoretically easy where there is no activity, whereas it is always more difficult, sometimes impossible and occasionally disastrous, when disease is active.

(2) In my view we are guilty of a sin of omission because we have all given far too much attention to repair after destruction, and far too little to the microscopic observation of the processes leading to that destruction. This is quite another matter, almost a private hobbyhorse, and it would be improper to give the animal another trial-run on this occasion, even though I believe that the predominant cause of destructive ear disease lies in an instability of deep meatal skin.

MR. I. SIMSON HALL: It has been a great pleasure to have had such excellent papers on this subject, and the results outlined by Dr. Plester are very valuable. I have been using this method of the external meatal skin for grafting for some little time and I can confirm all that he says about it.

Dr. Thorburn's contribution to the discussion is most timely, for I believe that the next real advance in this type of work will be the elimination of the mastoid cavity which we have been accustomed to regard as essential in any of

the larger mastoid operations. Experiment along the lines he has outlined is indicated and may prove fruitful.

I have had considerable experience of temporal muscle flaps for filling the cavity, but I gave up the method as it did not give as good results as other methods which I had at that time in use. It is possible that the fact that there were no antibiotics available when I carried out these observations may have explained my lack of success. I have recently been using a method of pedicle graft from below, and at present am filling the mastoid cavity with muscle, periosteum, and other tissues which are taken from behind the ear, with the pedicle over the origin of the sternomastoid. This seems to me to fill the cavity better than the flap coming from above, and it can also be covered with a skin graft to expedite healing. I believe that in a few years' time it will be as unusual to see a large cavity in the ear as it is to see a hole behind the mastoid following the Schwartze operation such as we saw 20 years ago.

WING CDR. P. F. KING: I congratulate the opening speakers on their interesting papers.

I wish to report a series of 135 ears in which myringoplasty was carried out by me. The series extends over four years; longest follow-up of 4 years and the shortest 6 months. For this discussion, successes are considered such only when the tympanic membrane is completely healed.

Results. Completely healed 94 (70 per cent.), failures 41 (30 per cent.). My results show a rising rate of success with the passage of time and the acquisition of practice. The results broadly compare with those of Mr. Mawson. A further point of interest is that in the first 2 years a "patch" operation of the sort described by Mr. Mawson was carried out, whereas in the second 2 years I was carrying out an operation which Mr. Thorburn would call an extended myringoplasty.

Some points of technique which might be of interest.

(*a*) Complete stripping of surface skin of tympanic membrane and excision of the deep meatal cuff of skin, using modified Zöllner suckers for dissection.

(*b*) Full thickness free skin graft, rather larger than a halfpenny, cut from the arm.

(*c*) Gelatine sponge soaked in antibiotic and Cortisone solution used as support in the middle ear.

(*d*) Green wool, soaked in Neocortef ointment, is used for packing the graft. The colour contrast facilitates the careful packing of the graft in its correct position and makes for easy removal of dressing.

Otitis Media. Otitis media occurring up to one year after operation was the primary cause of failure in 13 cases. Otitis media occurred in a further six cases, which healed well despite it or because of it. Three ears also had eczematous otitis externa after the operation but came to no harm.

Desquamation. I have only seen desquamation in those cases where fluid was macerating the superficial layer of the graft. In a normal case, I aim to remove a dry crust of surface epithelium from the graft at 2 months, finding underneath a well-healed tympanic membrane. A desquamating graft following myringoplasty generally indicates a leak of fluid from the middle ear.

GAVIN LIVINGSTONE: There should be more uniformity in reporting results of Tympanoplasties.

These are the three methods used to record the improvement in hearing. Firstly, reporting the reduction in the air bone gap; secondly, average improvement in decibels over 500, 1000, 1500 band, and thirdly, the percentage preservation or restoration of social hearing which has taken place. Social hearing is taken as a 30 db. level American standard, and I favour this latter method.

There are more techniques available to the otologist today than in other times. Fenestration is now often indicated in Tympanosclerosis. The uses of polythene tubing and interposition surgery is opening a vast field, although still unproven, and newer uses are being made of vein grafts.

With these newer methods and the probability that pedicle muscle grafts will solve the problem of the mastoid cavity, has the time come when healthy but useless tissue may be sacrificed in the middle ear in order to produce a standardized anatomical picture on which to reconstruct a functioning ear?

STUART R. MAWSON said he was now in a position to give the results of five years' work involving 62 operations of Myringoplasty. He had based the selection of cases on the assumption that the "safe" ear was a clinical reality and he had not carried out preliminary exploration of the antrum, attic, or stapes region prior to operation in any case, having selected them on the clinical criteria of a "safe" perforation that had been dry for 2 months. The standard of success as far as the hearing was concerned had been closure of the air-bone gap. The most success that could be gained in any case was 100 per cent. closure of the perforation and the air-bone gap and this had been achieved in only six cases. In two other cases there had been 100 per cent. closure of the air-bone gap without 100 per cent. closure of the perforation. In 10 there had been 50-99 per cent. closure of the air-bone gap with 100 per cent. closure of the perforation and in 16 there had been 5 to 49 per cent. closure of the air-bone gap with 100 per cent. closure of the perforation. In seven cases there had been 100 per cent. closure of the perforation but no closure of the air-bone gap and in two cases 100 per cent. closure of the perforation with widening of the air-bone gap. Out of 62 cases, however, 19 could be classified as unqualified failures of which six had had no closure of the perforation and the gap was wider. From study of these results he agreed with the previous speaker (Mr. Beales), that Myringoplasty was worthwhile provided very careful selection of the cases was undertaken. He felt that the absence of any serious complication vindicated the concept of the "safe" ear but that simple Myringoplasty might result in worsening of hearing if it was undertaken in cases in which it had not previously been established that the ossicular chain was intact and the Eustachian tube functioning.

W. STIRK ADAMS said he had used the sliding pedicle graft for obliteration of the cortical mastoid cavity in a series of 10 to 15 cases, some 20 years ago, a procedure originally suggested by Jenkins to avoid an epitympanomastoid operation in cases of relapsing otitis media with posterior marginal perforations in the drum head, with the object of preventing re-infection of the middle ear from the mastoid.

In its primary aim it had proved reasonably effective, and there were few recurrences of middle-ear infection, though there was seldom any significant improvement in the patient's hearing over the pre-operative level. There was, however, a serious and unforeseen disadvantage as these were never comfortable mastoids, and over the succeeding years practically all cases have required a revision operation with removal of the graft and the completion of an epitympanomastoid procedure.

In this technique the original operation was a full cortical exenteration, and the pedicle graft was then turned in to fill the cavity and occlude the posterior entrance to the aditus. In some cases it was taken from the temporal muscle with an anterior pedicle, in others from the upper sternomastoid, but in the majority a fibroperiosteal strap was elevated from under the posterior skin of the post-aural wound, with an inferior attachment, as this could be carried out without extending the original incision and avoided interference with muscular function.

The post-operative symptoms which ultimately made the revision necessary were in some cases a continuous local discomfort, others had a sense of dull pressure on the side of the head, with a general irritability, or a sense of irritation in the mastoid and temporal areas with dizziness at times, and others had attacks of unsteadiness and in some cases continuing vertigo.

After the development of distress symptoms the decision on the timing of the revision operation was left to the patient, and this was performed sometimes months, and often years later.

At the second operation there was no evidence of local infection in the mastoid, and after operation symptoms disappeared. When they were first encountered it was felt that the local symptoms might be the result of a tissue reaction in an over-sensitive patient, but in all other respects these were stable individuals, and as successive cases presenting symptoms of similar type occurred one recognized the syndrome and abandoned the operation.

These results seemed to indicate that in obliterating the mastoid and posterior aditus some physiological function of the mastoid alveolar system had been disturbed, and further reflection initiated the suggestion that this was likely to be an interference with a respiratory function of the lining membrane of the mastoid alveoli. Later the author's concept that this was a gas secretion by this epithelium was developed as an explanation of the presence of the residual air in the middle-ear cleft in cases of tubotympanic dysfunction, to which our President referred in his recent Presidential Address.

MR. MAXWELL ELLIS said Mr. Stirk Adams certainly surprises me when he says that he has often had trouble with temporal muscle grafts, and the symptoms he describes astonish me. My own experience is similar to that of Mr. Thorburn. Since I was first shown the technique of temporal muscle grafting by Mr. Kisch, over 20 years ago, I have employed the method with considerable success and in several different types of case. Mr. Kisch used the graft to fill the antrum and attic after a modified radical mastoid operation, but I have found it more useful in reducing the size of large radical mastoid cavities and large fenestration cavities, as a preliminary to a skin graft. In the days when one saw post-auricular fistulae I have employed a temporal muscle graft to fill the

post-aural cavity, forming a nutrient bed over which to draw the skin flaps. I have not employed it in the same way to fill the tympanic cavity, but there seems no reason why it should not be equally successful in this situation.

GENERAL NOTES

TEMPLE UNIVERSITY SCHOOL OF MEDICINE

PHILADELPHIA 40. PA.

A "Short course in Audiology" is offered several times each year by the Section of Audiology, Department of Otorhinology, Temple University School of Medicine, Philadelphia 40, Pa.

The course will be one week in length and will encompass theoretical and clinical aspects of audition. Hearing testing and interpretation will be stressed. Office procedures, equipment and Industrial Audiometry will be discussed.

Further information may be obtained by writing to Philip E. Rosenberg, Ph.D., Director, Section of Audiology, Temple University Medical Center, 3401 North Broad St., Philadelphia, Pa.

SIXTH INTERNATIONAL CONGRESS OF AUDIOLOGY

THE sixth International Congress of Audiology will be held in Leyden, The Netherlands, from September 5th to 8th, 1962.

President: Prof. Dr. H. A. E. van Dishoeck;

Secretary Drs. A. Spoor.

In the programme are planned three round-table talks, with associated and free papers.

The subject of the round tables are:

"Frequency analysis of the normal and pathological ear."
Moderator: Prof. Dr. G. von Békésy.
"Central deafness in children."
Moderator: Prof. Dr. J. M. Tato.
"Psychogenic deafness and simulation."
Moderator: Prof. Dr. H. A. E. van Dishoeck.

Official languages of the Congress are: English, French, German and Spanish.
Working languages will be: English and French.

The address of the secretariat is:

Ear-Nose-Throat Department,
Academisch Ziekenhuis,
LEIDEN (The Netherlands).

General Notes

BRITISH OTOLARYNGOLOGICAL CONGRESS

It is proposed to hold the first British Otolaryngological Congress in Great Britain in the summer of 1963 and an organizing committee is being set up for the purpose. It is expected that in addition to sessions for formal papers there will be a number of seminars on various topics and revision courses conducted by known authorities.

The Congress will probably last for five or six days.

Further details concerning time and place will be notified in this Journal in due course.

BACK JOURNALS REQUIRED AND FOR SALE

If any subscriber can spare copies of the January 1945 and June 1950 issues of the *Journal of Laryngology & Otology* they would be very much appreciated by the Librarian of The National Institute for the Deaf, 105 Gower Street, London, W.C.1.

If anyone would like to buy a set of the Journals from 1921 to 1960 (mostly bound volumes), and the two relevant indexes, etc., please apply to Donald G. P. Macalister, 5 Clarendon Place, Leamington Spa.

THE MOUNT SINAI HOSPITAL

An intensive postgraduate course in Rhinoplasty, Reconstructive Surgery of the Nasal Septum and Otoplasty will be given January 13th, 1962 to January 26th, 1962 by Dr. Irving B. Goldman and staff at the Mount Sinai Hospital, New York in affiliation with Columbia University.

Candidates for the course should apply to Registrar for Postgraduate Medical Instruction, The Mount Sinai Hospital, Fifth Avenue and 100th Street, New York 29, N.Y.

UNIVERSITY OF BAGHDAD

The University of Baghdad has asked the British Council to find British candidates for a number of posts in their Colleges of Medicine at Mosul and Baghdad. One of these appointments is for a Professor of Ear, Nose and Throat Diseases at the College of Medicine, Baghdad.

Anyone interested should communicate with the Director, Recruitment Department, The British Council, 65, Davies Street, London, W.1.

General Notes

ROYAL COLLEGE OF SURGEONS
OTOLARYNGOLOGY LECTURES

THE following lectures, arranged jointly by the Royal College of Surgeons of England and the Institute of Laryngology and Otology, will be delivered in the Lecture Hall of the College on Thursday afternoons at 5.30 p.m.

1961

November 30th. PROFESSOR F. BERGEL. "Newer Developments in Carcino-chemotherapy"

1962

February 1st. MR. GEOFFREY H. BATEMAN. "Hypophysectomy."
March 1st. MR. ALAN H. HUNT. "Tumours of the Upper Jaw."
May 3rd. DR. I. FRIEDMANN. "Electronmicroscopy in Otolaryngology."

THE INSTITUTE OF LARYNGOLOGY AND OTOLOGY

330-332, GRAY'S INN ROAD, LONDON, W.C.1.

associated with

THE ROYAL NATIONAL THROAT, NOSE & EAR HOSPITAL

SHORT COURSES
for
CONSULTANTS AND SENIOR REGISTRARS

November 10th and 11th, 1961—Pathology of the ear, nose and throat.
March 6th, 7th and 8th, 1962—Diagnosis and treatment of the deaf child.
April 27th and 28th, 1962—Practical Aural Surgery Class.

NON-MEDICAL COURSES

November 6th, 1961 to *February 2nd, 1962*—Training course for audiology technicians.

November 1st, 2nd and 3rd, 1961—Hearing testing techniques—health visitors.

May 30th and 31st and *June 1st, 1962*—Hearing and mental assessment of the deaf child—for psychologists.

The number of entries is limited in each course. A detailed syllabus of any of the above can be obtained on application from the Secretary-Administrator.

General Notes

MEETINGS & SEMINARS

especially arranged for

GENERAL PRACTITIONERS

who are cordially invited to attend all or any of the following without fee. Tea is available in the Refectory from 4.30 p.m. onwards on Fridays.

Friday, November 10th, 1961—3.30 p.m. "Nasal obstruction."—MR. J. C. HOGG.

Sunday, December 3rd, 1961—10.15 a.m. "Seminar—Common ear, nose and throat conditions."—MR. WALLACE BLACK.

Friday, December 8th, 1961—3.30 p.m. "Pulmonary disease in relation to E.N.T." —DR. NORMAN HULBERT.

Friday, January 5th, 1962—3.30 p.m. "Treatment of acute inflammation in the ear."—MR. WILLIAM MCKENZIE.

Friday, January 19th, 1962—3.30 p.m. "Vasomotor and allergic rhinitis—chronic rhinitis."—MR. WALLACE BLACK.

Friday, February 2nd, 1962—3.30 p.m. "Disorders of blood in E.N.T. practice." —DR. D. A. OSBORN.

Friday, February 16th, 1962—3.30 p.m. "Vertigo and its differential diagnosis." —DR. C. H. EDWARDS.

Sunday, February 25th, 1962—10.15 p.m. "Seminar—Common ear, nose and throat conditions."—MR. WILLIAM MCKENZIE.

Friday, March 2nd, 1962—3.30 p.m. "Malignant diseases of the larynx—hoarseness."—MR. MAXWELL ELLIS.

Friday, March 16th, 1962—3.30 p.m. "Sinusitis."—MR. W. D. DOEY.

Friday, April 6th, 1962—3.30 p.m. "Dysphagia."—MR. G. H. HOWELLS.

Sunday, April 15th, 1962—10.15 a.m. "Seminar—Common ear, nose and throat conditions."—MR. W. D. DOEY.

Friday, April 27th, 1962—3.30 p.m. "Emergencies in throat, nose and ear practice."—MR. S. E. BIRDSALL.

Friday, May 4th, 1962—3.30 p.m. "Surgical treatment of deafness."—MR. K. MCLAY.

Friday, May 18th, 1962—3.30 p.m. "Chemotherapy in oto-laryngology."—DR. I. FRIEDMANN.

There is a limited number of appointments in the associated Hospital as Clinical Assistants and Out-Patient Assistants for which general practitioners are eligible to apply. Particulars of these can be obtained from the House Governor of the Hospital upon request.

Tea is

Hogg.
se and

.N.T."

in the

nitis—

ctice."

nosis."

se and

rynx—

throat

nd ear

Ir. K.

gy."—

tal as
ioners
House